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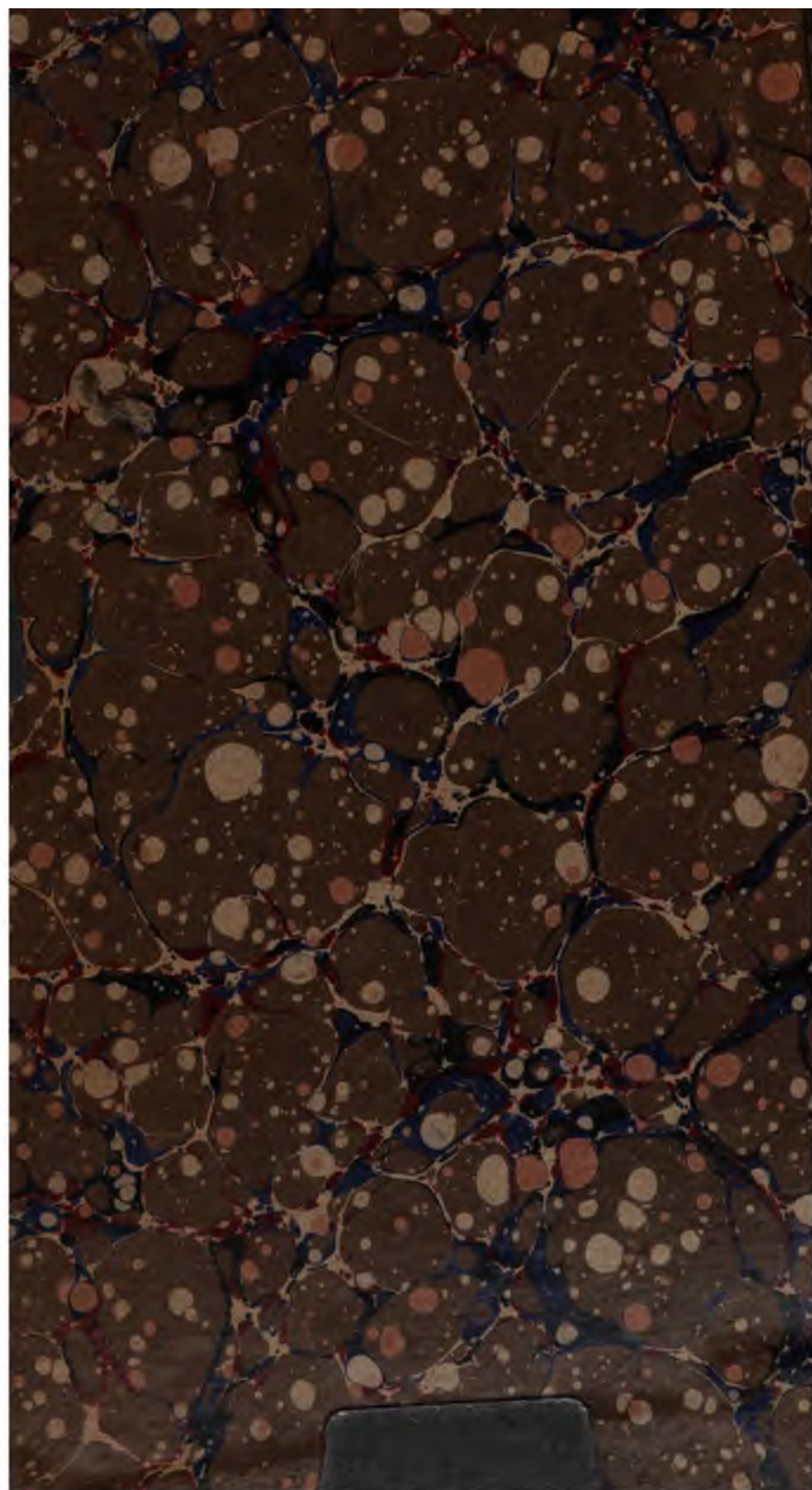
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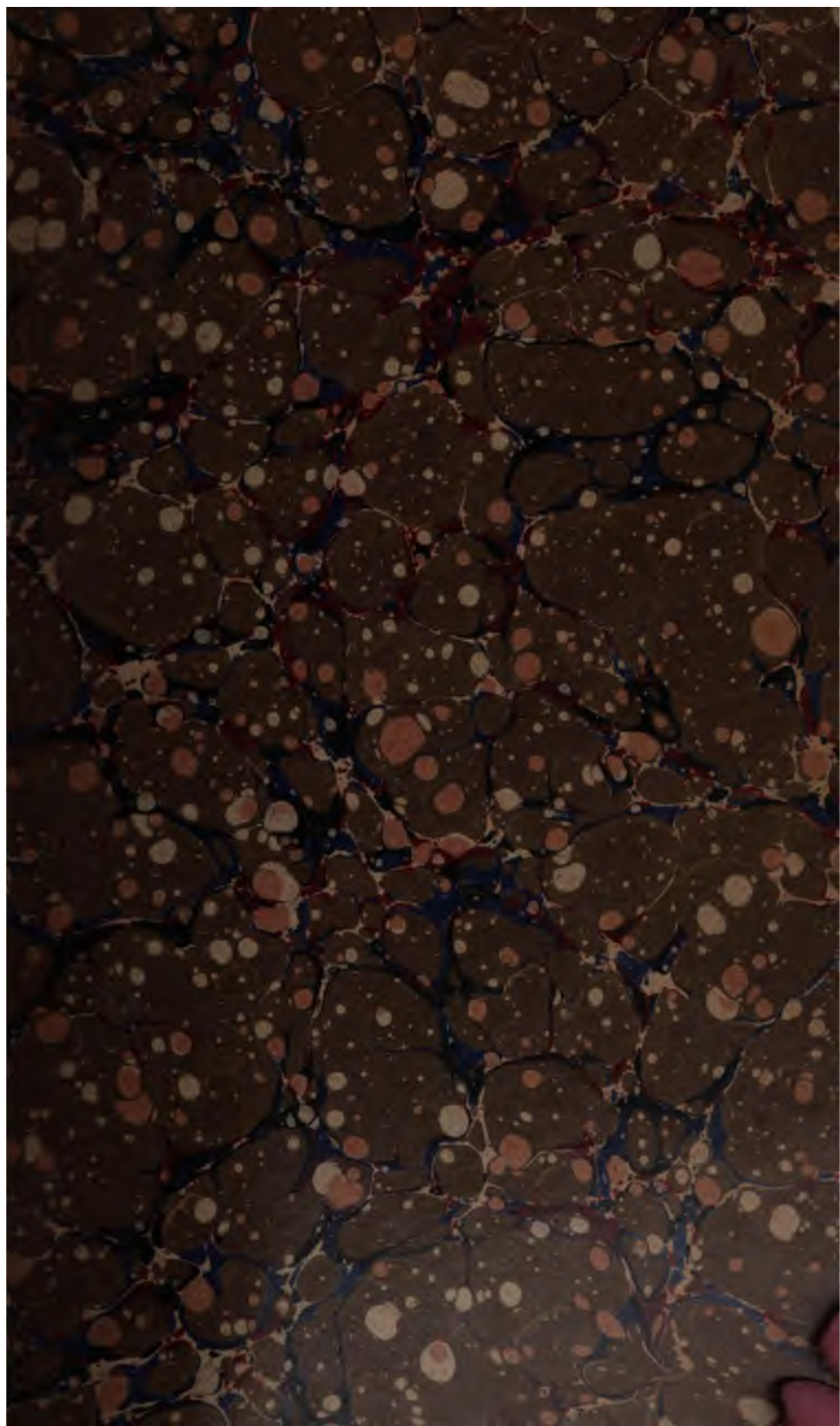
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# PROCEEDINGS

OF THE

## Biological Society of Washington

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### VOLUME XIII

1899 - 1900

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WASHINGTON  
PRINTED FOR THE SOCIETY  
1901

**COMMITTEE ON PUBLICATIONS**

**1899**

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OF THE  
BIOLOGICAL SOCIETY OF WASHINGTON

For 1899.

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(ELECTED DECEMBER 17, 1898)

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PROCEEDINGS  
OF THE  
BIOLOGICAL SOCIETY OF WASHINGTON

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PROCEEDINGS.

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The Society meets in the Assembly Hall of the Cosmos Club on alternate Saturdays at 8 p. m. Brief notices of the meetings, with abstracts of the papers, are published in *Science*.

January 14, 1899—300th Meeting.

The President in the chair and 32 persons present.

W. H. Ashmead exhibited specimens of *Chirodamus*, a rare South American wasp, three specimens of which had been found in a collection presented to the National Museum by the U. S. Fish Commission.

Vernon Bailey described\* an interesting case of protective coloration in *Ochotona*.

C. L. Pollard exhibited photographs of the laboratory buildings of the New York Botanical Garden in course of erection.

V. K. Chesnut exhibited photographs and fruits of the California laurel (*Umbellularia californica*), a plant belonging to the olive family, the leaves of which contain a volatile oil which is distilled and used for medicinal purposes. The fruits are greatly valued by the Indians as an article of food.

The following communications were presented:

C. L. Marlatt: A New Nomenclature of the Broods of the Periodical Cicada.\*

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\*Bull. No. 18, New Series, Division of Entomology, U. S. Dept. of Agr., Nov., 1898, pp. 52-58.

E. A. De Schweinitz: The Practical Working of the Serum Treatment for Swine.\*

Erwin F. Smith: The Effect of Acid Media on the Growth of Certain Plant Parasites.†

**January 28, 1899—301st Meeting.**

The President in the chair and 57 persons present.

The evening was devoted to a symposium upon the topic 'The Great Dismal Swamp', with the following speakers:

David White: Geology and Physiography of the Dismal Swamp.

F. G. Gardner: Soils of the Dismal Swamp.‡

Thomas H. Kearney: The Flora of the Dismal Swamp.§

William Palmer: The Fauna of the Dismal Swamp.

**February 11, 1899—302d Meeting.**

The President in the chair and 13 persons present.

A severe blizzard was in progress and the society adjourned immediately after the reading of the minutes of the preceding meeting.

**February 25, 1899—303d Meeting.**

The President in the chair and 33 persons present.

H. J. Webber discussed the recent researches of Lawson on *Cobaea scandens* in which a new method of spindle formation is described.

Gen. Sternberg called attention to the falling of leaves of *Magnolia grandiflora* in Washington caused by the recent severe cold.

The evening was devoted to the further discussion of the Dismal Swamp. The following speakers participated: W. H. Seaman, F. D. Gardner, F. V. Coville, William Palmer, Vernon Bailey, A. K. Fisher, M. B. Waite, and Lester F. Ward.

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\*The Serum Treatment of Swine Plague and Hog Cholera. Bull. 23 Bureau Animal Industry, U. S. Dept. of Agr., 1899, pp. 1-18.

†To be published as a Bulletin of the Division of Vegetable Physiology and Pathology, U. S. Dept. of Agr.

‡To be published in Contributions U. S. Nat. Herb.

§To be published in Contributions U. S. Nat. Herb.

**March 11, 1899—304th Meeting.**

The President in the chair and 93 persons present.

The evening was devoted to a lecture by Mr. Robert T. Hill on 'The Natural Aspects of Porto Rico' (illustrated by numerous lantern slides).

**March 25, 1899—305th Meeting.**

The President in the chair and 39 persons present.

The following communications were presented:

T. S. Palmer: The Danger of Introducing Noxious Animals and Birds.\*

M. B. Waite: The Effects of the Recent Severe Cold on Vegetation.

F. A. Lucas: The Mental Traits of the Fur-Seal.†

**April 8, 1899—306th Meeting.**

The President in the chair and 39 persons present.

The following communications were presented:

William Palmer: The Ferns of Hemlock Bluff.‡

O. F. Cook: Notes on the Habits of African Termites.

Erwin F. Smith: Biological Characteristics as a Means of Species Differentiation.

**April 22, 1899—307th Meeting.**

The President in the chair and 38 persons present.

The following communications were presented:

T. D. A. Cockerell: Faunae and Faunulae of New Mexico.

Oscar Loew: On the fermentation of Tobacco.§

Albert F. Woods: Some Microchemical Reactions resembling Fungi.||

**May 6, 1899—308th Meeting.**

In the place of the regular meeting of the Society, a joint meeting with the Chemical Society was held, President Stokes

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\*Yearbook U. S. Dept. of Agr., 1898, pp. 87-110, figs. 1-6.

†Report of Fur-Seal Investigation of 1896-7, Vol. III, pp. 69-74.

‡The Plant World 2: 143-149. 1899.

§Report No. 59, U. S. Dept. of Agr.

||Science n. s. IX, No. 223, pp. 508-510. April 7, 1899.

of the Chemical Society presiding, assisted by the President of the Biological Society.

The evening was devoted to a lecture by Dr. Oscar Loew on 'The Function of Mineral Substances in Organisms'\* which was followed by ten-minute discussions by H. W. Wiley and Frank Cameron, of the Chemical Society, and A. F. Woods and Erwin F. Smith, of the Biological Society.

#### May 20, 1899—309th Meeting.

The President in the chair and 37 persons present.

The following communications were presented:

C. Hart Merriam: The Fauna and Flora of Mount Shasta Contrasted with those of the Sierra Nevada and Cascade Ranges.†

Charles L. Pollard: Species Characters among Violets.

Sylvester D. Judd: Birds killed by the Monument during the Night of May 12, 1899.

William Palmer: The evolution of a Subspecies.‡

#### October 21, 1899—310th Meeting.

The President in the chair and 25 persons present.

The following communications were presented:

O. P. Hay: A Census of North American Fossil Vertebrates.§

V. K. Chesnut: Notes on a Preliminary Catalogue of Plants Poisonous to Stock.||

Herbert J. Webber: Polyembryony in Citrus Hybrids.¶

\*Bull. No. 18, Division of Vegetable Physiology and Pathology U. S. Dept. of Agr.

†The Boreal Fauna and Flora of Shasta contrasted with Corresponding Faunas and Floras of the Sierra and the Cascades. N. Am. Fauna No. 16, pp. 69-82, October 28, 1899.

‡Auk. July, 1900. Under the title 'Ecology of the Maryland Yellowthroat and Its Relatives'.

§Science n. s. X, pp. 681-684. 1899.

||15th An. Rept. Bureau of Animal Industry, U. S. Dept. of Agr., pp. 387-420. 1899.

¶Jour. Royal Hort. Soc. London, Vol. XXIV, under the title "Work of the United States Department of Agriculture on Plant Hybridization".



Albert F. Woods: Additional Notes on the Spot Disease of Carnations.\*

November 9, 1899—311th Meeting.

The President in the chair and 26 persons present.

The following communications were presented:

L. O. Howard: Preliminary Notice of an Investigation of the Insect Fauna of Human Excrement.†

W. H. Dall: Notes on Honolulu and the Hawaiian Islands.‡

G. K. Gilbert: The Submerged Forests of the Columbia River.

November 18, 1899—312th Meeting.

The President in the chair and 39 persons present.

H. J. Webber called attention to the morphologically compound nature of the leaves of *Ampelopsis tricuspidata* and exhibited specimens collected by Doctor Evans.

The following communications were presented:

F. A. Lucas: Letter from H. H. Field concerning the Concilium Bibliographicum and the proposed Catalogue of the Royal Society.

F. V. Coville: The Botanical Explorations of Thomas Nuttall in California.§

Barton W. Evermann: A Physical and Biological Survey of Lake Maxinkuckee.

December 2, 1899—313th Meeting.

The President in the chair and 31 persons present.

W. H. Dall exhibited specimens of *Barringtonia speciosa* and called attention to the practice of stupifying the fish by this so called fish poison by throwing the bruised kernels into small ponds, etc.¶

Walter Evans stated that trifoliate and tripartite grape leaves

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\*Bull. No. 19, Division of Vegetable Physiology and Pathology U. S. Dept. of Agr. 1900.

†Proc. Wash. Acad. Sci. II, pp. 541-603. 2 pl. and 22 figs.

‡Nation LXIX, No. 1792, pp. 331-333, Nov. 2, 1899.

§Proc. Biol. Soc. Wash. XIII, pp. 109-121, Dec. 30, 1899.

¶Nation LXIX, p. 331.

are occasionally found similar to the specimens of *Ampelopsis tricuspidata* exhibited at the preceding meeting.

F. V. Coville exhibited an entire and bisected cone of *Pinus attenuata* both covered with lichens. These cones it was stated remain on the trees from twenty to fifty years and seem to open and release the seeds only when exposed to great heat, so that no seedlings of this pine were to be seen except where the ground had been swept over by fire.

The following communications were presented:

L. H. Dewey: Frost Flowers.

H. J. Webber: The Effect of Hybridization in the Origination of Cultivated Plants.\*

O. P. Hay: The Chronological Distribution of Elasmobranchs.†

#### December 16, 1899—314th Meeting.

The President in the chair and 24 persons present.

H. J. Webber spoke of the necessity for a new horticultural term like *race* to refer to varieties of cultivated plants propagated by vegetative parts.

G. K. Gilbert called attention to the necessity for a broad term to apply to the sum of plants and animals occurring in a region. Attention was called to the word *life*.

The following communications were presented:

Lester F. Ward: The fossil Forests of Arizona.‡

F. A. Lucas: Blue Fox Trapping in the Pribilofs.§

M. B. Waite: Soil Inoculation Experiments with Soy Beans.

#### December 30, 1899—315th Meeting.

##### TWENTIETH ANNUAL MEETING.

The President in the chair and 11 persons present.

The annual reports of the Recording Secretary and Treasurer

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\*Yearbook U. S. Dept. of Agr. 1899, pp. 465-490, incorporated in an article entitled "Progress of Plant-breeding in the United States."

†Will appear in Trans. Am. Phil. Soc.

‡Published as "Report on the Petrified Forests of Arizona". Dept. of the Interior, 1900.

§Science, Jan. 26, 1900, pp. 125-128.

were read, and officers for the ensuing year elected as follows:

President: F. V. Coville.

Vice-presidents: Wm. H. Ashmead, C. W. Stiles, B. W. Evermann, F. A. Lucas.

Recording Secretary: H. J. Webber.

Corresponding Secretary: T. W. Stanton.

Treasurer: F. H. Knowlton.

Members of the Council: T. S. Palmer, C. L. Marlatt, A. F. Woods, C. L. Pollard, M. B. Waite.

The following standing committees were appointed by the President:

*On Communications*: F. A. Lucas, B. W. Evermann, A. F. Woods, V. K. Chesnut, and W. H. Osgood.

*On Publications*: F. H. Knowlton, T. S. Palmer, and C. L. Pollard.

#### January 13, 1900—316th Meeting.

Vice-president Lucas in the chair and 56 persons present.

W. R. Maxon called attention to an interesting bifurcation in a flight feather of the peacock.

William Palmer exhibited specimens of various fern fronds showing abnormal bifurcations.

W. H. Seaman mentioned a case of the bifurcation of the fourth rib in man.

F. A. Lucas spoke of the common occurrence of such bifurcations in animals.

H. J. Webber called attention to the similar bifurcations in the trunk of *Sabal palmetto*, three cases having been observed in Florida. One specimen of the same palm had been observed with three and one with four branches in the trunk; but such branching, is very rare.

The following communications were presented:

Vernon Bailey: Where the Grebe Skins come from.\*

J. W. Daniel, Jr.: Zoological Collecting in Cuba.

William Palmer: The ferns of the Lower Shenandoah Valley.

E. L. Morris: A Revision of the Species of *Plantago* commonly referred to *P. patagonica*.†

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\*Bird Lore II, p. 34. February, 1900.

†Bull. Torr. Bot. Club. 27: 105-109. 1900.

**January 27, 1900—317th Meeting.**

The President in the chair and 30 persons present.

William Palmer exhibited specimens of abnormal fern fronds.

H. J. Webber exhibited specimens and photographs of aerating roots of *Taxodium*, *Aricennia*, *Laguncularia*, and *Rhizophora*.

O. F. Cook described a mangrove growing on dry land in Africa.

W. T. Swingle spoke of the occurrence of cypress knees in Europe where Doctor Lotsy stated they were not formed.

The following communications were presented:

T. A. Williams: Notes on a New *Lecidea* from Mexico.

Barton W. Evermann: Some observations concerning Species and Subspecies.\*

**February 10, 1900—318th Meeting.**

The President in the chair and 45 persons present.

H. J. Webber exhibited a photograph of the tropical papaw (*Carica papaya*).

B. W. Evermann described the papaw as occurring in Puerto Rico.

The following communications were presented:

Henry W. Olds: Form in the Songs of Birds.

M. G. Kains: The Effect of the Electric Arc Light in the Culture of Easter Lilies.†

E. V. Wilcox: Lupines as Plants Poisonous to Stock.‡

**February 24, 1900—319th Meeting.**

The President in the chair and 8 persons present.

The following communications were presented:

W. A. Orton: The Sap-Flow of the Maple in Spring.

M. B. Waite: Michigan Peach Orchards.§

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\*Science, n. s., 11: 451-455. March 23, 1900.

†Florists Exchange, Feb. 22, 1900.

‡Jour. Comp. Med. and Vet. Arch. 20: 666-774. 1899.

§Report Maryland State Hort. Soc. 2: 41.

**March 10, 1900—320th Meeting.**

The President in the chair and 125 persons present.

The evening was devoted to a lecture by Prof. Dean C. Worcester on "The Birds and Mammals of the Philippines" (illustrated by lantern slides).

**March 24, 1900—321st Meeting.**

Vice-president Lucas in the chair and 46 persons present.

B. W. Evermann exhibited a number of colored illustrations of the peculiar and interesting fishes of Puerto Rico.

The following communications were presented:

Sylvester D. Judd: Feeding Experiments with Captive Birds.

W. H. Osgood: Notes on a Trip down the Yukon River.\*

F. A. Lucas: The Tusks of the Mammoth.

**April 7, 1900—322d Meeting.**

Vice-president Ashmead in the chair and 37 persons present.

W. P. Hay exhibited living specimens of an interesting Crustacean (*Branchipus serratus*). It was stated that this genus, which is normally a fresh water form, has been transformed into a salt water form by being grown in salt solutions.

F. D. Gardner exhibited specimens of fine oolitic sand from shore of Salt Lake.

The following communications were presented:

L. O. Howard: Some New Illustrations of Insects (illustrated with lantern slides).

F. W. True: The Newfoundland Whale Fishery (illustrated with lantern slides).

**April 21, 1900—323d Meeting.**

The President in the chair and 28 persons present.

H. J. Webber described the migration of the vegetative nucleus in the pollen-tube of *Zamia* from the apex of the tube, when growth in that region ceases, back to the pollen-grain end of the tube, when the growth begins in that section of the tube just previous to fecundation.

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\*N. Am. Fauna, No. 19. October 6, 1900. Under the title "Results of a Biological Reconnoissance of the Yukon River Region."

The following communications were presented:

C. H. Townsend: The Flying Foxes of the South Sea Islands (illustrated with lantern slides).

V. K. Chesnut: Acorns as Food.

W. A. Orton: The Sap-flow of the Maple (illustrated with lantern slides).

**May 5, 1900—324th Meeting.**

In the place of the regular meeting, a joint meeting with the Chemical Society was held, President Bolton, of the Chemical Society presiding. 65 persons were present.

The program for the evening consisted of a symposium on the topic "The Chemical and Biological Properties of Proto-plasm". The discussion was led by Oscar Loew,\* H. J. Webber, H. N. Stokes, and A. F. Woods.

**May 19, 1900—325th Meeting.**

Vice-president Lucas in the chair and 76 persons present.

The program of the evening consisted of a lecture by C. H. Townsend on "The Cruise of the Albatross in the South Sea Islands, with Notes on the Interesting Races of People Inhabiting the Islands, Their Natural History, etc." (illustrated with lantern slides).

**October 20, 1900—326th Meeting.**

The President in the chair and 49 persons present.

The following communications were presented:

H. J. Webber: Notes on Cotton Hybrids.†

L. H. Dewey: Some Foreign Varieties of Cotton.

W. A. Orton: Selection for Resistance to the Wilt Disease of Cotton.‡

L. M. Tolman: Economic Uses of Cotton Seed Oil.

**November 3, 1900—327th Meeting.**

The President in the chair and 23 persons present.

F. A. Lucas described a specimen of Buffalo Fish recently

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\*Science, n. s., 11: 930-935. June 15, 1900.

†New England Cotton Manufacturers' Association Report, 1900.

‡2 Bull. No. 27, Division of Vegetable Physiology and Pathology, U. S. Dept. of Agr.

received at the National Museum, which had no mouth. The fish, which had attained a weight of over one pound, must have fed by means of the gill openings.

W. H. Dall called attention to the discovery by T. Wayland Vaughan of a fossil coral reef in Decatur County, Georgia.\*

The following communications were presented:

L. O. Howard: Insects Affecting Cotton.

Henry James: Recent Progress in Forestry.

M. W. Lyon: Notes on Venezuelan Zoology.

F. A. Lucas: The Deposit of Mastodon Bones at Kimmswick, Missouri.

#### **November 17, 1900—328th Meeting.**

The President in the chair and 57 persons present.

W. H. Dall spoke of a specimen of *Chiton* recently collected by Mr. Hemphill near San Diego, California, which had only six valves instead of the normal number eight.

M. B. Waite exhibited an abnormal apple showing a combination of three more or less perfect fruits. The specimens came from an orchard near Los Angeles, California, and the collector stated that such abnormal fruits were of common occurrence.†

The following communications were presented:

C. W. Stiles: The Structure and Life History of the Parasites of Malaria.

L. O. Howard: The Malaria Mosquitoes; Their Biology; What has been done and What may be done to Exterminate Them (illustrated with lantern slides).‡

#### **December 1, 1900—329th Meeting.**

Vice-president Lucas in the chair and 26 persons present.

The following communications were presented:

L. Stejneger: On Post-Pliocene Migration of Siberian Animals into Europe.

Erwin F. Smith: Sugar Beets in New York and Michigan.

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\*Science n. s., 11: 873. December 7, 1900.

†Will be published in Rural New Yorker.

‡Bull. No. 25, New Series, Division of Entomology, U. S. Dept. of Agr.

**December 15, 1900—330th Meeting.**

The President in the chair and 25 persons present.

F. A. Lucas exhibited a skeleton of the gar-pike where a fracture in the skull had caused a marked deflection but which had not resulted in death, as shown by the callus connecting the broken bones.

The following communications were presented:

C. W. Stiles: Some Tropical Parasites that may be Introduced by our Returning Troops.

E. W. Nelson: The Caribbean Seal.

**December 29, 1900—331st Meeting.**

(TWENTY-FIRST ANNUAL MEETING.)

Vice-president Lucas in the chair and 19 persons present.

The annual reports of the Recording Secretary and Treasurer for the year 1900 were presented and the following officers elected for the ensuing year:

President: F. A. Lucas.

Vice-presidents: B. W. Evermann, Wm. H. Ashmead, C. W. Stiles, F. H. Knowlton.

Recording Secretary: W. H. Osgood.

Corresponding Secretary: T. W. Stanton.

Treasurer: David White.

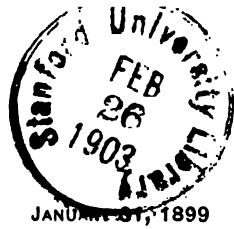
Members of the Council: A. F. Woods, C. L. Pollard, T. S. Palmer, M. B. Waite, H. J. Webber.

The following standing committees were appointed by the President-elect:

On Communications: B. W. Evermann, V. K. Chesnut, W. H. Osgood, A. F. Woods.

On Publications: C. L. Pollard, T. S. Palmer, David White.





PROCEEDINGS  
OF THE  
BIOLOGICAL SOCIETY OF WASHINGTON

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NOTES ON THE NAKED-TAILED ARMADILLOS.\*

BY GERRIT S. MILLER, JR.

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The following notes on the naked-tailed armadillos are the result of an attempt to name some specimens belonging to the United States National Museum, the Academy of Natural Sciences of Philadelphia, the American Museum of Natural History, and Mr. Outram Bangs. The subject naturally divides itself into four sections: 1, History of the generic and subgeneric names; 2, The genus *Tatoua* and its subgenera; 3, The naked-tailed armadillo of Central America, and 4, Comparison of three small species of *Tatoua*.

1. HISTORY OF THE GENERIC AND SUBGENERIC NAMES.

Wagler, in 1830, was the first author to recognize the naked-tailed armadillos as a distinct genus. He called the group *Xenurus*, unaware that, four years earlier, this name had been used by Boie in Ornithology. The large species then recently described as *Dasypus gymnurus* by Wied, but previously named *Dasypus unicinctus* by Linnaeus, served as the type of his new genus.

Gray, in 1865 and 1869, divided Wagler's genus into two subgenera, the first containing the large species known to Wagler, the second the small *Dasypus hispidus* described by Burmeister in 1854. To the second, which he expressly states that he had never seen, he transferred the name *Xenurus* in a restricted sense, while to the first he applied a new name, *Tatoua*. *Tatoua*, thus exactly equivalent to Wagler's *Xenurus*, is therefore the first tenable generic name for the naked-tailed armadillos.

In 1873 Gray again applied the name *Xenurus* to the large species, mak-

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\* Published by permission of the Secretary of the Smithsonian Institution.

ing no reference to his previous subdivisions, and describing the small *hispidus* as a new species, '*X. latirostris*.' Another small armadillo, which he regarded as the representative of a new genus, he described under the name *Ziphila lugubris*.

Not until 1891 was the fact recognized that the name *Xenurus* is untenable for a mammal. Then Ameghino pointed out the long-standing error, but overlooking Gray's *Tatoua*, proposed as a substitute for *Xenurus* the new name *Lysiurus*.

In this course Ameghino has recently been followed by Trouessart, who refers the naked-tailed armadillos as a whole to *Lysiurus*, and places under it as a subgenus Gray's *Ziphila*, notwithstanding that the latter was named eighteen years earlier.

The little known *Ziphila lugubris* has been a source of continual uncertainty, though since Gray, most writers, Trouessart excepted, have agreed in regarding it as very doubtfully distinct from '*Xenurus*' *hispidus*, an animal much better represented in collections. It is, however, in no way closely related to *Tatoua hispida*, but a distinct species, the representative of a well-marked subgenus, for which, of course, the name *Ziphila* is available.

## 2. THE GENUS TATOUA AND ITS SUBGENERA.

### Genus TATOUA Gray.

1830. *Xenurus* Wagler, Natürl. Syst. der Amphibien, mit vorang. Classif. der Säugeth. und Vögel, p. 36. Type *Dasypus gymnurus* Wied = *D. unicinctus* Linnaeus. (Not *Xenurus* Boie, 1826.)
1865. *Xenurus* Gray, Proc. Zool. Soc. London, p. 377.
1865. *Tatoua* Gray, Proc. Zool. Soc. London, p. 378.
1869. *Xenurus* Gray, Catal. Carnivorous, Pachydermatous and Edentate Mammalia in the British Museum, p. 383.
1869. *Tatoua* Gray, Catal. Carnivorous, Pachydermatous and Edentate Mammalia in the British Museum, p. 384. Type *Dasypus unicinctus* Linnaeus.
1873. *Xenurus* Gray, Hand-List of the Edentate, Thick-Skinned and Ruminant Mammals in the British Museum, p. 21.
1891. *Lysiurus* Ameghino, Revista Argentina de Hist. Natural, I, p. 254. Type *Dasypus unicinctus* Linnaeus.
1898. *Lysiurus* Trouessart, Catal. Mamm. tam vivent. quam foss., p. 1146.

*Type species*.—*Tatoua unicincta* (Linnaeus).

*Characters*.—Teeth  $\frac{8-8}{8-8} = 32$  to  $\frac{9-9}{9-9} = 36$ , subcylindrical in form, the last about opposite middle of zygomatic arch and some distance in advance of posterior border of palate; tail long, covered with minute, thin widely spaced plates; claws on front feet very greatly developed.

## Subgenus TATOUA Gray.

1865. *Tatoua* Gray, Proc. Zool. Soc. London, p. 378.  
 1869. *Tatoua* Gray, Catal. Carnivorous, Pachydermatous and Edentate Mammalia in the British Museum, p. 384.  
 1873. *Xenurus* Gray, Hand-List of the Edentate, Thick-Skinned and Ruminant Mammals in the British Museum, p. 21.  
 1898. *Lysiurus* Trouessart, Catal. Mamm. tam vivent. quam foss., p. 1146.

*Type species.*—*Tatoua uncinata* (Linnæus).

*Subgeneric characters.*—Crown armor consisting of 50 to 60 small, roundish, irregularly arranged plates; ears rounded, funnel-formed, densely coated with minute scales on outer side; cheeks covered with thin plates arranged in distinct rows.

## Subgenus ZIPHILA Gray.

1873. *Ziphila* Gray, Hand-List of the Edentate, Thick-Skinned and Ruminant Mammals in the British Museum, p. 22. Type *Z. lugubris* Gray.  
 1898. *Ziphila* Trouessart, Catal. Mamm. tam vivent. quam foss., p. 1148.

*Type species.*—*Tatoua lugubris* (Gray).

*Subgeneric characters.*—Crown armor consisting of 30 to 40 symmetrically arranged, mostly pentagonal or hexagonal plates; ears pointed, not funnel-formed, the outer side bare except along margin; cheeks with a few widely spaced, irregularly scattered scales.

## 3. THE NAKED-TAILED ARMADILLO OF CENTRAL AMERICA.

Dr. A. von Frantzius published the first record of the occurrence of a naked-tailed armadillo in Central America in 1869. He was uncertain as to the identification of the animal—the ‘armadillo de zopilote’ of the Costa Ricans, so called on account of the disagreeable buzzard-like odor of its flesh—as he saw only a living individual and a skull. Both, however, indicated an animal smaller than the *Dasyurus gymnotus* of Illiger (= *D. uncinatus* Linnæus), to which he with hesitation referred the species. Doubt was cast on this record by Alston in 1880, who found no naked-tailed armadillos among the collections that served for the elaboration of the mammals of the Biologia Centrali-Americana.

In 1895 Mr. Frederick W. True recorded a small *Tatoua* from Chamelicon, Honduras, the first positively known to have been taken in Central America. In the absence of material for comparison, he regarded the animal as “presumably the *X[enurus] hispidus* of Burmeister.”

Two years later Mr. A. Alfaro and Dr. J. A. Allen confirmed Dr. von Frantzius’ Costa Rican observations by recording the capture of a specimen at Suerre, Costa Rica. This animal is referred to ‘*Xenurus gymnotus*’ (= *Tatoua uncinata*) without comments on the doubts expressed by Dr. von Frantzius, or on Mr. True’s identification of the Honduras specimen.

So far as I know, this completes the published history of the naked-tailed armadillo in Central America. I may add, however, that Mr. José C. Zeledón has recently informed me that the armadillo de zopilote is well known in Costa Rica, where the worthlessness of its flesh for food is everywhere recognized.

I have recently compared the two Central American specimens with one from Santa Marta, Colombia, and two from Matto Grosso, Brazil. The latter prove to be representatives of the subgenus *Tatoua*, while all of the others are referable to *Ziphipha*. The Costa Rican and Honduras specimens are precisely alike in all important characters, but they differ in many details from the Colombian animal, which in all probability is the same as Gray's *Ziphipha lugubris*. While the fact that Gray's type came from Brazil throws some doubt on this determination of the specimen from Colombia, it does not lessen the probability that the Central American *Ziphipha* is distinct from the one hitherto described. The Central American animal may stand as:

***Tatoua (Ziphipha) centralis* sp. nov.**



FIG. 1.—Head from side: upper figure, *Tatoua (Tatoua) hispidula*; lower figure, *T. (Ziphipha) centralis* (type).  $\frac{2}{3}$  nat. size.

1869. *Dasyurus gymmurus* Frantzius, Wiegmann's Archiv für Naturgeschichte, XXXV, Bd. I, p. 309 (not *Dasyurus gymmurus* Illiger, 1815).

1895. *Xenurus hispidus* True, Proc. U. S. National Museum, XVIII, p. 435 (not *Dasyurus hispidus* Burmeister, 1854).

1897. *Xenurus gymmurus* Alfaro, Mamíferos de Costa Rica, p. 46.

1897. *Xenurus gymmurus* Allen, Bull. Am. Mus. Nat. Hist., IX, p. 43.

Type, adult ♀ (skin and skull), No. 13464, United States National Museum, collected at Chamelicon, Honduras, January 8, 1891, by Erich Wittkugel.

*General characters*.—Smaller than *Tatoua (Ziphipha) lugubris* (Gray); cheeks with fewer scales; plates in central rings of carapace more numerous (20–31, instead of 27);

occipital region of skull much less elevated; zygomata when viewed from above nearly parallel with each other and with main axis of skull; hamular processes of pterygoids neither thickened nor bent inward at tips.

## 4. COMPARISON OF THREE SMALL SPECIES OF TATOUA.

**Tatoua (Tatoua) hispida** (Burmeister).

1854. *Dasypus hispidus* Burmeister, Syst. Uebers. der Thiere Brasiliens, 1st Theil (Mammalia), p. 287 (Lagoa Santa, Brazil).  
 1873. *Xenurus latirostris* Gray, Hand-List of the Edentate, Thick-Skinned, and Ruminant Animals in the British Museum, p. 22 (St. Catharines, Brazil).

Crown shields about 55 (50-60), very irregular both in form and arrangement, their sides and angles rounded, none regularly pentagonal or hexagonal, those at front of shield gradually diminishing in size and distinctness. Cheeks covered with thin scales, closely set in distinct rows. Ears rounded above, the lower lobe greatly developed, the resulting form of the conch roughly funnel-shaped, with a distinct notch in the periphery in front below, and another behind above. A long, low ridge on inner side of conch above and in front of meatus. Internal surface of ear naked. External surface densely coated with roundish scales about 1 mm. in diameter.

Rough periphery of plates of body armature very conspicuous, the smoother central portion generally irregular and much pitted. Scapular shield consisting of seven or eight rows, the longest of which contains about 28 plates. On neck in front of scapular shield are three rows (the longest containing about 8 plates) of rectangular, closely appressed plates, the anterior rows regularly imbricating over the posterior. Dorsal rings 9, the longest containing 25 plates. Pelvic shield containing 9 rows, the longest with about 25 plates; the

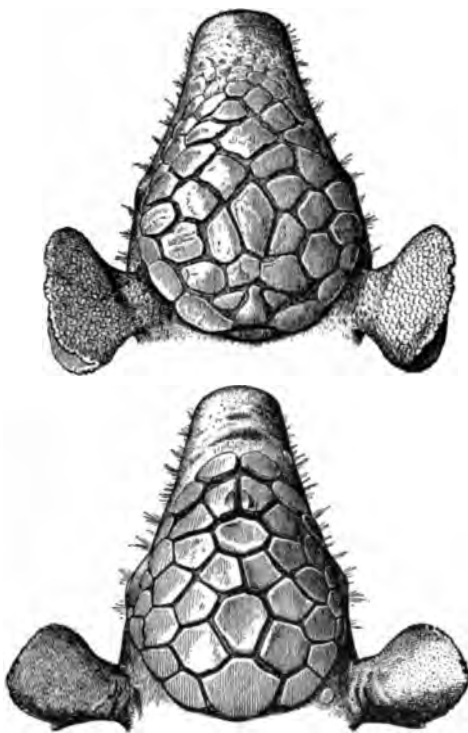


FIG. 2.—Head from above: upper figure, *Tatoua (Tatoua) hispida*; lower figure, *T. (Ziphila) centralis* (type).  $\frac{2}{3}$  nat. size.

furrows between the plates wide and irregular. The majority of the plates of the dorsal armature are provided with from one to four conspicuous, grayish, bristle-like hairs, which spring from the posterior borders and mostly from the corners of the plates; when from the posterior edge, away from the corners, each hair stands in a distinct excavation or scallop. These bristles are most conspicuous on the sides of the body, where they are often 15 mm. in length.

Tail about one-half as long as body armature, the scales arranged in about 10 rows; longest scales (near base of tail) oval, about 4 mm. long and half as broad; most of the scales on dorsal surface of tail with 1-3 short bristles springing from posterior edge.

Skin of belly with transverse rows of well-developed scales, the rows about 7 mm. apart; each scale with a tuft of 4-6 appressed bristles springing from its posterior edge, the scales themselves averaging about 2 mm. by 3 mm. in size. Outer side of feet and legs covered with large scales (the largest 7 mm. by 9 mm.), from the posterior edges of which spring conspicuous tufts of bristles.

Skull triangular in profile, the facial line little broken by supraorbital swellings or postorbital depression. Zygomatics greatly expanded and thickened at middle.

#### **Tatoua (*Ziphipha*) *lugubris* (Gray).**

1873. *Ziphipha lugubris* Gray, Hand-List of the Edentate, Thick-Skinned, and Ruminant Mammals in the British Museum, p. 23 (St. Catharines, Brazil).

Crown shields about 33 (30-35), regular in form and bilaterally symmetrical in arrangement, their angles distinct and sides (usually 5 or 6) straight, those at front of shield large and equal to the others in definiteness of form. Each cheek with about 20 small, irregularly scattered scales. Ears pointed above, the lower lobe very slightly developed, the resulting form of conch not at all funnel-shaped. A short high ridge on inner side of conch above and in front of meatus. Internal surface of ear naked. External surface of ear naked except for a row of scales, each about 1 mm. in diameter, along entire external border of conch, and a secondary row 7 mm. in length extending downward from slightly developed notch between upper and lower lobes.

Rough periphery of plates of body armature inconspicuous, the smooth central portion generally flat and polished. Scapular shield consisting of 7 or 8 rows, the longest of which contains about 28 plates. On neck in front of scapular shield are two or three rows (the longest containing about 8 plates) of irregularly lenticular, widely spaced plates, the rows not imbricating. Dorsal rings 10, the longest consisting of 26-27 plates. Pelvic shield containing 10 rows, the longest with about 25 plates; the furrows between the plates narrow and regular in outline. The majority of the plates of the dorsal armature are provided with one or two small, very inconspicuous bristles growing from the extremities of the posterior

borders. These bristles, the longest of which are less than 10 mm. in length, are more readily detected by touch than by sight.

Tail considerably more than half as long as body armature, the scales arranged in about 14 rows; longest scales (near base of tail) roundish, about 3 mm. in diameter; most of the scales on dorsal surface, with one (never more) bristle springing from posterior edge.

Skin of belly with transverse rows of poorly developed scales, the rows about 7 mm. apart; each scale with a tuft of 3-5 appressed bristles; the largest of the scales slightly smaller and less definite in form than those of *T. hispida*, the smaller reduced to mere elevations in the skin, surmounted by the tuft of bristles. Outer side of feet and legs covered with scales, the largest of which are not more than 5 mm. by 7 mm. in diameter.

Skull triangular in profile, the facial line distinctly broken by the prominent supraorbital swellings. Rostrum noticeably more slender than in *T. hispida*; zygomata much more lightly built than in *T. hispida*, bent outward so as form almost an angle at middle. Palate behind tooth row narrower than in *T. hispida* and abruptly raised to a slightly higher plane. Hamulars thickened and strongly bent inward at tips.

#### **Tatoua (*Ziphipha*) *centralis* Miller.**

1899. *Tatoua (Ziphipha) centralis* Miller, Proc. Biol. Soc. Washington, XIII, p. 4.

Crown shields about 38 (37-39), otherwise as in *T. lugubris*. Each cheek with less than a dozen small, irregularly scattered scales. Ears as in *T. lugubris*, except that scales along border of conch are less conspicuous and secondary row on back of ear is lacking.

General character of plates of body armature as in *Z. lugubris*. Scapular shield consisting of seven or eight rows, the longest of which contains about 28 plates. Neck shields as in *T. lugubris*. Dorsal rings 10, the longest containing 29-31 plates. Pelvic shield as in *T. lugubris*. Bristles, tail, and scales on belly and legs as in *T. lugubris*.

Skull slightly larger than in *T. lugubris*; rostrum distinctly longer. Hamulars neither thickened nor bent inward at tip. Zygomata much less strongly bent outward than in *T. lugubris*, so that, when viewed from above, they are nearly parallel.

Cranial Measurements of Three Species of *Tatoua*.

	<i>T. hispidus</i> ,* Brazil.	<i>T. hispidus</i> ,* Brazil.	<i>T. lugubris</i> ,† Colombia.	<i>T. centralis</i> ,‡ Honduras.	<i>T. centralis</i> ,§ Costa Rica.
Greatest length.....	83	75	73	80	78
Basal length.....	75	69	67	73	72
Basilar length.....	68	62	61	65	64
Occipital depth.....	29	26	27	29	28
Depth of rostrum at tip of premaxil- laries.....	11.6	11	9	9.4	9.4
Mastoid breadth.....	36	36	35	38	37
Zygomatic breadth.....	46	42	38.6	41	39
Interorbital constriction.....	27	25	24.4	24	26
Rostral constriction.....	19	17	16.4	17	18
Length of nasals.....	29	.....	23	27	28
Palatal length.....	47	44	44	47	47
Mandible.....	30	26	28	28.4	29
Upper tooth row.....	63	58	58	62	60
Lower tooth row.....	27.4	24	24	25	26.4

\* Academy of Natural Sciences, Philadelphia.

† Bangs collection.

‡ Type, U. S. National Museum.

§ American Museum of Natural History.



PROCEEDINGS  
OF THE  
BIOLOGICAL SOCIETY OF WASHINGTON

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A NEW PIGMY *ORYZOMYS* FROM THE SANTA MARTA  
REGION OF COLOMBIA.

BY OUTRAM BANGS.

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Mr. W. W. Brown Jr.'s collection from Santa Marta, Colombia, contains series of two species of pigmy *Oryzomys*. I have sent specimens of both species to Mr. Oldfield Thomas, who has, with great kindness, compared them with the material in the British Museum. One species is *O. dryas humilior* Thomas, originally described from Bogotá. The other, although near *O. fulvescens* Allen and Chapman, from Jalapa, Mexico, proves to be new. Of *O. dryas humilior* Mr Brown took twelve specimens, all at Macotama (alt., 8000 ft.). Of the new form he took ten specimens at Palomina (5000 ft.), Pueblo Viejo (8000 ft.), and San Miguel (7500 ft.).

The two forms are very different; *O. dryas humilior*, the larger, may always be known by its darker colors and rich fulvous under parts. The new form may be known from the following description:

*Oryzomys navus*\* sp. nov.

*Type* from Pueblo Viejo, Sierra Nevada de Santa Marta, Colombia. No. 8107, ♂ adult, coll. of E. A. and O. Bangs. Collected March 26, 1898, by W. W. Brown, Jr. Altitude, 8000 feet.

*General characters*.—Apparently nearest *O. fulvescens* Allen and Chapman from Jalapa, Mexico, differing in longer tail, smaller ears, paler, more yellowish coloration and purer white under parts. Skull not showing any marked differences from skulls of other members of this group,

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\* *Navus*, diligent, active.

10      *Bangs—A New Pigmy Oryzomys from Colombia.*

although slightly different from that of the *O. dryas* group (see Thomas, Ann. and Mag. Nat. Hist., 7th ser., II, 1898, p. 267).

*Color.*—Upper parts tawny ochraceous, lined with brownish black-tipped hairs, which are most numerous on top of head and on middle of back, but more scattering on rump; lower sides and upper surface of arms and legs paler and more mixed with buffy; under parts white, the hairs pale gray at base on center of belly only, while on throat, neck, and under surface of legs they are white to the base; ears dark brown; feet and hands whitish; tail very long, nearly naked, dusky above, dull grayish white below.

*Measurements.*—The type, ♂ adult, total length, 193; tail vertebræ, 115; hind foot (with claw), 20; ear from notch, 14. The two largest individuals from San Miguel measure—No. 8223, ♂ adult, total length, 200; tail vertebræ, 115; hind foot (with claw), 22; ear from notch, 13; and No. 8225, ♀ adult, total length, 200; tail vertebræ, 115; hind foot (with claw), 22; ear from notch, 13.

Skull, the type, ♂ adult, basal length, 17.6; zygomatic width, 11.6; mastoid width, 9.2; interorbital width, 3.8; length of nasals, 7; length of upper molar series, 3.2; length of mandible, 11.2.

*Remarks.*—There is a slight individual variation in color among the ten specimens of *O. navis*, due principally to the greater or less number of black-tipped hairs scattered along the back and head—some specimens being more nearly clear tawny ochraceous than the type.

The species of pigmy *Oryzomys* form a compact group of closely related forms, many of which may prove only subspecifically distinct from one another, but until their relationships are better understood it seems well to give the new form full specific rank.

PROCEEDINGS  
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DESCRIPTION OF A NEW VOLE FROM EASTERN  
SIBERIA.\*

BY GERRIT S. MILLER, JR.

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A small *Microtus* taken at Plover Bay, East Siberia, has remained unidentified in the United States National Museum for more than thirty years. It differs from any of the Asiatic species of which I can find descriptions, and may be known as:

*Microtus tshuktshorum* sp. nov.

*Type*, ♀ adult (in alcohol), No. 34916, United States National Museum, collected at Plover Bay, East Siberia, by Lt. Dawson (received in 1866).

*General characters*.—Most like *Microtus kamtschaticus* (Polyakoff), from Petropaulski, Kamchatka, but smaller; skull with shorter nasals, less perforated palate, and much smaller angular process of the mandible (in this character resembling *M. kadiacensis*).

*Ears*.—Except for their very small size—they are much overtopped by the surrounding fur—the ears show no characters of importance.

*Feet*.—The feet are similar to those of *M. arvalis*. Palms with five tubercles, all well developed. Soles with five large tubercles and a rudimentary sixth.

*Fur and color*.—The fur is remarkably soft and long, some of the hairs on the back reaching a length of nearly 20 mm. After its long immersion in alcohol the fur has probably lost all trace of its original color. It is now dull chestnut on the back, soiled yellowish white on the belly.

*Skull*.—The skull of *Microtus tshuktshorum* is small and rounded, little ridged for muscular attachment. In general form it agrees closely with that of *M. kamtschaticus*, but the nasal bones are very noticeably shorter (5.8 mm. in *M. tshuktshorum*, as opposed to a range of from 6.8 to 7.8 in

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†Tshuktshorum, Tschuktski, a tribe of natives in eastern Siberia.

seven skulls of *M. kamschaticus*), and the palate differs notably from that of any of the specimens of *M. kamschaticus* in the small size and insignificant number of foramina immediately in front of the lateral bridges. As a result the bridges are not distinguishable. The mandible is conspicuously more slender than that of *M. kamschaticus*, and the articular and angular processes are very noticeably weaker. In this respect *M. tschuktschorum* shows an approach to *M. arvalis* of Europe, and an even closer resemblance to *M. kadiacensis*.

Teeth as in *M. kamschaticus*.

*Measurements.*—Total length, 113; tail vertebrae; 29; pencil, 8; hind foot (with claws), 19; ear from meatus, 10; ear from crown, 8. Skull: greatest length, 23.8; basal length, 23; basilar length, 21.6; zygomatic breadth, 13; interorbital constriction, 4; mastoid breadth, 12; palatal length, 12.4; diastema, 7.8; nasals, 5.8; incisive foramen, 4; mandible, 14.8; maxillary tooth row (alveoli), 6.4; mandibular tooth row, 6.

PROCEEDINGS  
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A NEW VOLE FROM HALL ISLAND, BERING SEA.\*

BY GERRIT S. MILLER, JR.

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A specimen of *Microtus* collected by Mr. C. H. Townsend on Hall Island, Bering Sea, represents a species distinct from any hitherto described. It is a rather large member of the typical group of the subgenus *Microtus*, and is more nearly related to a Siberian species which I suppose to be *M. kamschaticus* (Polyakoff) than to any of the known Alaskan members of the genus except *M. kadiacensis*. On account of its remarkably short tail it may be called :

***Microtus abbreviatus* sp. nov.**

*Type*, ♀ young adult (skin and skull), No.  $\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}$ , United States National Museum, collected on Hall Island, Bering Sea, September 8, 1885, by C. H. Townsend.

*General characters*.—Size rather large (hind foot, 23 mm.); tail shorter than hind foot; plantar tubercles, 6; ears concealed in the fur; enamel pattern essentially as in *Microtus arvalis* of Europe.

*Fur and color*.—The fur is dense and only moderately long—about 12 mm. in length at middle of back—but the specimen was taken when in the midst of the autumnal molt, with the short new hairs of the winter coat appearing as a dense mat among the roots of the longer fur. As the skin has been preserved in alcohol for an unknown period,† the original color of the animal cannot be determined with certainty. In its present condition the dorsal surface is light yellowish brown, duller on head,

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\* Published by permission of Secretary of the Smithsonian Institution.

† Mr. Townsend tells me that the specimen was preserved dry. It was received at the National Museum in September, 1886, and its subsequent history is not known. It was found in a bottle of alcohol in October, 1898.

clearer on rump, paling on the sides to the soiled buff of the under parts, which are slightly darker on chest. Tail bicolor, brownish above, yellowish white beneath. Feet dirty whitish.

*Skull and teeth.*—The skull is imperfect, lacking the occipitals and one of the audital bullæ. It resembles that of *M. kamschaticus* very closely, but the rostrum is slightly narrower anteriorly, the mandible is less heavily built, and the bony palate is noticeably different in form. In the palate of *M. kamschaticus* the lateral bridges are broad and well developed and the lateral pits are deep and very noticeable. In *M. abbreviatus* the bridges are small and barely complete, while the pits behind them are shallow and inconspicuous. In no one of the seven specimens of *M. kamschaticus* with which I have compared it is the peculiar palate of *M. abbreviatus* closely approached.

Teeth slightly smaller than in *M. kamschaticus*, but enamel pattern essentially the same in the two species. *M. abbreviatus*, however, has the anterior loop of the front lower molar distinctly longer than in *M. kamschaticus*. In *M. kamschaticus* there is usually a well developed fourth outer salient angle on the posterior upper molar. This is quite absent in *M. abbreviatus*, but the character is not likely to prove constant.

*Measurements.*\*—Total length, 120; tail vertebrae, 19 (pencil, 9); hind foot, 22.5; ear from meatus, 9.5; ear from crown, 6. Skull: greatest length, 27; zygomatic breadth, 15; interorbital constriction, 4; nasals, 7.8; mandible, 17.4; maxillary tooth row (alveoli), 6.4; mandibular tooth row (alveoli), 6.6.

*General remarks.*—*Microtus abbreviatus* is closely related to both *M. kamschaticus* and *M. kadiacensis*, though in external appearance its short, densely haired tail gives it a much closer resemblance to the members of the subgenus *Phaiomys*. In cranial and dental characters it differs from *M. kadiacensis* much as it does from *M. kamschaticus*, since these two species agree closely in palate structure and in the form of the front lower molar.

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\*All from skin in alcohol.

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THE FLORIDA PUMA.

BY OUTRAM BANGS.

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In his book entitled 'Hunting and Fishing in Florida,' published in 1896, Mr. Charles B. Cory gave a brief description of the Florida Puma, and named it *Felis concolor floridana* (pp. 109-110). This name is untenable, both Desmarest\* and Fischer† having used *Felis floridana*‡ for the Florida Lynx.

I therefore propose for the Florida Puma the name :

***Felis coryi* sp. nov.**

**Type** from the wilderness back of Sebastian, Florida. No. 7742, ♂ old adult, coll. of E. A. and O. Bangs. Collected Jan. 1, 1898, by F. R. Hunter.

**General characters.**—Size very large; feet very small; apparently no seasonal change in color; back ferruginous, finely lined with blackish; sides paler and more fawn color; skull like that of the North American pumas, and not at all like the skulls of Central and South American species.§

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\* Mammalogie, 1820, p. 225, species No. 350.

† Synopsis Mamm., 1829, p. 213.

‡ *Lynx floridanus* Raf., Am. Monthly Mag., 1817, p. 46. Based on the Lynx or Wildcat of Bartram.

§ See description of *Felis hipolestes* Merriam, Proc. Biol. Soc., Wash., vol. XI, July 15, 1897, p. 219. I have compared skulls of the Florida Puma with that of a fine adult ♀ taken at Santa Marta, Colombia, Feb. 15, 1898, by W. W. Brown, Jr., which I take to be true *Felis concolor* Linn. That of *F. concolor* is very small, with low, flat unswollen frontals; long, slender and only slightly decurved postorbital processes; differently shaped nasals; much less well developed sagittal crest, falling much farther back; small teeth; and inner cusp of carnassial not well developed. Roughly speaking, this skull resembles that of a large ocelot more than it does the skulls of North American pumas.

*Color*.—Type, ♂ old adult. Pelage very short and rather harsh. Top of head, upper surface of neck and back, and upper half of tail ferruginous, finely lined with blackish tipped hairs, with little bunches of white hairs scattered here and there; sides of neck and body, an ill-defined patch above and behind each shoulder, a band across under side of neck, and upper surfaces of limbs, paler and more inclined toward fawn color, many of the hairs with darker tips; under parts, including under surfaces of limbs and under side of tail, soiled whitish, except on middle of body, where the color is much darker and more hair brown; tail dusky toward end and nearly black at tips; ears black, grizzled around edges; hairs between pads of feet black; face rather dark and grizzled with a light spot above each eye; patch at base of whiskers black; whiskers mostly white, but in a few cases black.

Other specimens, though killed at different seasons of the year, differ but little from the type. A kitten three-fourths grown is similar, but has the uppersurface marked with large, irregular dusky spots.

*Cranial characters*.—Skull large, showing all the characters of the North American pumas pointed out by Dr. Merriam. It is apparently narrower than the skull of *F. hipolestes* Merriam, with less widely spreading zygomatica. I have compared it with a skull of *F. oregonensis* Raf.,\* from the vicinity of Tacoma, Wash., and find it slightly narrower, with less widely spread zygomatica; slightly narrower palatal extension; palate ending in more of a curve—less squarely. These differences are trifling, however, and may not be constant.

*Measurements*.—The following measurements of the type and an old ♀, No. 7743, killed at the same time and place, were taken by F. R. Hunter from the animals in the flesh. Type, ♂ old ad.: whole length, 6 ft. 9 in.; fore leg, 2 ft. 8 in.; hind leg, 2 ft. 8 in.; girth of chest, 2 ft. 7 in.; of waist, 2 ft. 8 in.; of neck, 22½ in. No. 7743, ♀ old ad.: whole length, 6 ft. 3½ in.; fore leg, 2 ft. 5 in.; hind leg, 2 ft. 6 in.; girth of chest, 2 ft. 2 in.; of waist, 2 ft.; of neck, 21½ in.

Total length reduced to millimeters and the tails and hind feet measured by me from the skins are as follows: Type, total length, 2057.4; tail, without hairs, 760; hind foot, 280. No. 7743: total length, 1917.7; tail, without hairs, 670; hind foot, 271. No. 6992, very old male topotype, unmeasured, is even larger and has a larger skull.

*Skull*.—Type, basal length, 171; occipitonasal length, 194; zygomatic width, 135; palatal length (from end of pterygoid process to back of middle incisors), 110.4; postpalatal length, 91; width across postorbital processes, 75; interorbital width, 40.8.

No. 5489, old adult ♀ topotype: basal length, 157.4; occipitonasal length, 175; zygomatic width, 126; palatal length, 102; postpalatal length, 84; width across postorbital processes, 76.6; interorbital width, 40.

*Remarks*.—According to all the information I have been able to glean, the Florida Puma is now restricted to peninsular Florida and can no longer

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\* Stone, Science, N. S., Jan. 6, 1899, pp. 34-35.



intergrade with any other form, and it is doubtful if it ever did.\* It must, therefore, be given full specific rank.

Compared with true *F. concolor* Linn., *F. coryi* is a huge Puma, and is indeed but little smaller than the giant of the Rocky Mountains, *F. hypolestes* Merriam. Its long limbs, small feet, and rich ferruginous color are the best characters by which to distinguish it from other North American pumas. It needs no comparison with the small pumas of northern South America or of Central America.

The Bangs collection now contains six specimens of *F. coryi* (skins and skulls complete), all taken by F. R. Hunter in the same general region of Florida, namely, the great wilderness back of Sebastian, in Brevard and Okechola counties. Mr. Hunter writes that three of these pumas, the type an old female and the young female, were all killed together on New Year's day, 1898.

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\* Mr. F. W. True, in his monograph on the Puma, under the head of Virginia, says: "Mr. Hallock makes the very interesting statement that the Puma is found in the Dismal Swamp. I find no other reference to its occurrence in the low coastlands of the South Atlantic States except in Florida" (p. 509).



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DESCRIPTIONS OF SIX NEW RODENTS OF THE  
GENERA *APLODONTIA* AND *THOMOMYS*.

BY C. HART MERRIAM.

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Specimens of *Aplodontia* from a few miles south of the Cascades of the Columbia—apparently the type locality of *A. rufa*—differ specifically from the small coast animal commonly mistaken for *rufa*. Comparison of the typical form with specimens from the Olympic Mts., the coast of Oregon, and Point Reyes, California, shows that several very distinct species remain undescribed. The northern form of the Sierra-Cascade species also proves to be different from typical *A. major*. All of these are here described, and with them two new Pocket Gophers from northwestern Washington.

***Aplodontia pacifica* sp. nov.**

*Type* from Newport, mouth of Yaquina Bay, Oregon. No. 77372 ♀ ad. U. S. Nat. Mus., Biological Survey Coll. Collected March 20, 1896, by B. J. Bretherton. Original No. 2219.

*Characters*.—Size small, by far the smallest of the known species; ear longer (higher) than in any of the others; color darker and richer; white spot at base of ear usually distinct.

*Color*.—Upper parts in winter pelage fulvous brown, strongly mixed with black hairs, the fulvous strongest on flanks and sides of neck, least apparent on head and rump, which parts are sepia or bister, becoming dusky on nose; top of head strongly mixed with black hairs; cheeks suffused with fulvous; under parts plumbeous, strongly washed with fulvous; legs, feet and tail grizzled grayish-dusky.

*Cranial characters*.—Skull small, light, and relatively narrow; zygomata less spreading than in the other species; rostrum slender; interorbital constriction rather broad; palate narrow. Contrasted with *A. rufa* the

skull is decidedly smaller and narrower, the rostrum longer and much more slender; the zygomata very narrow, not spreading or bowing outward as in *rufa*; audital tubes very much more slender and much shorter; frontal platform between orbits and rostrum (seen from above) very much smaller, narrower, and more rounded laterally—less flattened.

*Dental characters*.—Small upper premolar very large, at least twice as large as in *rufa* or *major*, molars actually as large as—relatively much larger than—in *rufa*.

*Measurements*.—Type specimen: Total length 304; tail vertebræ 22; hind foot (in dry skin, moistened) 48.

#### *Apodontia phæa* sp. nov.

*Type* from Pt. Reyes, Marin Co., California. No. 4444 ♂ ad. Merriam Coll. Collected August 1, 1886, by C. A. Allen. Orig. No. 142.

*Characters*.—Size small; coloration (in July and August specimens) remarkably uniform grizzled bistre brown without rufous or fulvous; ears much smaller (shorter) than in *A. pacifica*.

*Cranial characters*.—Skull of medium size, larger than that of *pacifica*, smaller than that of *rufa*; zygomata spreading but less bowed out than in *rufa*, the anterior root standing out squarely with a well developed angle; rostrum slender; nasals short, abruptly narrowed posteriorly, and ending considerably in front of posterior plane of premaxillæ; interorbital region broad; audital bullæ and tubes intermediate in size between those of *rufa* and *pacifica*, the tubes of same length as in *pacifica*—much shorter than in *rufa*; incisive foramina small and compressed or 'pinched in'; small upper premolar about as in *rufa*—decidedly smaller than in *pacifica*.

*Measurements*.—Type specimen: Total length 330; tail vertebræ 30; hind foot (in dry skin, moistened) 55.

#### *Apodontia olympica* sp. nov.

*Type* from Quenilt Lake, Olympic Mts., Washington. No. 89549 ♂ yg.-ad. U. S. National Museum, Biological Survey Coll. Collected July 24, 1897, by R. T. Young. Original No. 309.

*Characters*.—Similar to *A. rufa* but larger and darker; upper parts less 'reddish' or fulvous; nose darker; white spot at base of ear absent or poorly developed.

*Cranial characters*.—The skull of *A. olympica* differs from that of *A. rufa* in the following characters: interorbital constriction decidedly narrower (measuring from 8.5 to 10 mm. in 8 adults as contrasted with 11 mm. in the narrowest of the *rufa* series); zygomata standing out more strongly anteriorly with a thickened elbow at the angle; jugal not obliquely expanded but developing a postorbital ridge or process which forms the only upward projection from the arch—the posterior projection in *rufa*, formed by the thickened anterior end of the squamosal, being absent; audital bullæ, particularly the long bony tubes, much smaller; auditory meatus much smaller and more nearly a complete circle, with notch on upper side smaller and narrower.

*Measurements*.—Type specimen: Total length 350; tail vertebræ 35; hind foot 55.

**Aplodontia major rainieri** subsp. nov.

*Type* from Paradise Creek, south side Mt. Rainier, Washington (alt., 5200 ft.). No 90144 ♂ ad. U. S. Nat. Mus., Biological Survey Coll. Collected August 6, 1897, by Vernon Bailey. Orig. No. 6122.

*Characters*.—Similar to *A. major* but paler and grayer throughout, particularly the underparts and region around mouth; whiskers mainly white instead of black; audital tubes smaller; incisive foramina shorter and slightly more open; basioccipital notch shallower; jugal narrower and more slender throughout.

*Measurements*.—Type specimen: Total length 375; tail vertebrae 33; hind foot 62.

**Thomomys melanops** sp. nov.

*Type* from timberline at head of Soleduc River, Olympic Mts., Washington. No. 90630 ♀ ad. U. S. Nat. Mus., Biological Survey Coll. Collected Aug. 28, 1897, by Vernon Bailey. Orig. No. 6219.

*Characters*.—Size small; coloration as in *T. mazama*—nose, space round eye and large postauricular patch (embracing ear) slate black in strong contrast to dull chestnut of upper parts; under parts dark plumbeous, washed with buffy fulvous; feet and wrists white. *T. douglasi* from the north side of the Columbia River has the entire head reddish chestnut, concolor with the back, but in cranial characters agrees best with the present species.

*Cranial characters*.—Skull similar to that of *douglasi* but smaller; interparietal shorter posteriorly, barely notching supraoccipital; mastoid bullæ smaller: basioccipital less excavated by audital bullæ; anterior root of zygoma (seen from above) broader and more squarely truncate, infringing more on frontals.

*Measurements*.—Type specimen: Total length 206; tail vertebrae 63; hind foot 27.

**Thomomys douglasi yelmensis** subsp. nov.

*Type* from Tenino, Yelm Prairie, Washington. No. 13314 ♂ ad. U. S. Nat. Mus., Biological Survey Coll. Collected Oct. 24, 1891, by C. P. Streater. Orig. No. 1385.

*Characters*.—Similar to *T. douglasi* but very much paler; face with the dark markings of the mountain species.

*Cranial characters*.—Skull like that of *douglasi* but interparietal larger; frontals depressed interorbitally; angle of mandible standing out farther and projecting anteriorly so as to form a distinct hook; incisors broader and thicker.

*Measurements*.—Type specimen: Total length 222; tail vertebrae 68; hind foot 32.



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## NOTES ON THREE GENERA OF DOLPHINS.

BY T. S. PALMER.

In looking over a list of the genera of Cetaceans recently, my attention was called to several names of doubtful validity which are still in common use. These names are *Neomeris*, *Orca*, and *Tursio*, now applied to members of the Delphinidæ, but which are preoccupied in other groups.

*Neomeris*, based on *Delphinus phocænoides* Cuvier, from the Cape of Good Hope, was described by Gray in 1846,\* but the name had been previously used by Lamouroux in 1816 for a genus of polyps.† In 1891 both Blanford and Lydekker mentioned that *Neomeris* was unavailable for a genus of mammals, but not considering the group sufficiently distinct did not rename it. True, in 1889, gave *Neomeris* full generic rank in his 'Review of the Family Delphinidæ' (pp. 114, 178), and this course has been followed by Trouessart.‡ As the group is likely to be recognized either as a genus or subgenus, it should receive a name, and may be called *Neophocæna* from its close relationship to *Phocæna*, the well known genus of porpoises.

For half a century the killers have been placed in the genus *Orca* established by Gray in 1846 in the same paper in which he named *Neomeris*. A somewhat careful search has failed to reveal any earlier use of *Orca* for this group, but the name

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\* Zool. Erebus & Terror, p. 30, 1846.

† Hist. Polypiers coralligènes flexibles, 1816.

‡ Catalogus Mammalium, fasc. V, p. 1042, Nov., 1898.

proves to have been originally proposed by Wagler in 1830\* to include two ziphioid whales, *Delphinus bidentatus* Hunter and *D. desmarestii* Risso. *Orca* is therefore untenable for the genus to which it is generally applied, unless it can be shown that it was so used prior to 1830. It becomes incumbent on those who wish to preserve *Orca*, to show that it was originally applied to the killers, otherwise the earliest available name seems to be *Orcinus* of Fitzinger,† and the common species will stand *Orcinus orca* (Linn.).

*Tursio* is one of the unfortunate names which have been given to several different groups. It was applied by Gray, in 1843, to the group of dolphins of which *Delphinus tursio* is the type, but afterwards when it was discovered that Wagler had previously used *Tursio* for *Delphinus peronii* Lacépède of the southern seas, it was transferred to this group, while Gray's *Tursio* was renamed *Tursiops* by Gervais. *Tursio* proves to have been used still earlier by Fleming, in 1822,‡ for a group of sperm whales, including *T. vulgaris* and *T. microps* (= *Physeter microps* Linn.). These species are not now recognized, and it is doubtful whether any such species exist, but this does not alter the fact that Fleming applied, or intended to apply, the name to a genus of *Physeteridae*, thereby precluding its use in any other group. Both *Orca* and *Tursio* as originally used are apparently synonyms of other genera and therefore drop out of use. The genus to which *Tursio* has been applied by True and other recent authors has for its type *Delphinus peronii* and has received no less than four distinct names: *Tursio* Wagler, 1830, *Lissodelphis* Gloger, 1841, *Delphinapterus* Gray, 1846, and *Leucorhamphus* Lilljeborg, 1861. *Tursio* and *Delphinapterus* are both preoccupied, and *Leucorhamphus* is simply a new name for *Delphinapterus*. *Lissodelphis*§ seems to be the first available name for the genus, and the species therefore becomes *Lissodelphis peronii* (Lacépède).

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\* Nat. Syst. d. Amphibien, p. 34, 1830.

† Wiss.-Populäre Naturgesch. Säugethiere, VI, pp. 204-217, 1860.

‡ Philosophy of Zoology, II, p. 211, 1822.

§ Gloger, Hand-u. Hilfsbuch d. Naturgeschichte, p. 169, 1841.



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DESCRIPTIONS OF NEW BIRDS FROM NORTHWESTERN  
MEXICO.

BY E. W. NELSON.

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The birds here described were obtained during the past few months by Mr. E. A. Goldman while making collections in western Mexico for the Biological Survey of the U. S. Department of Agriculture. A number of birds from southwestern Sonora show closer relationship to forms peculiar to the Cape St. Lucas region of Lower California than to races of the same species in southern Arizona. This is well illustrated by several House Finches from Alamos, Sonora, which are scarcely distinguishable from typical *Carpodacus mexicanus ruberrimus* from Lower California. This interesting relationship between the birds of the mainland and those of the peninsula is somewhat similar to that which exists between certain species found near San Blas, Tepic, and their representatives on the Tres Marias Islands.

In addition to the birds named in the present paper, several others have been described from Sonora, south of Guaymas. These are Mr. Brewster's *Psittacula cyanopygia pallida*, *Thryophilus sinaloa cinereus*, and *Polioptila nigriceps restricta* (Auk, VI, pp. 85-98, 1889), and *Callipepla gambeli fulvipectus* Nelson (Auk, XVI, pp. 26-27, 1899), all from Alamos. The result of the comparatively small amount of work on the birds of this region seems to indicate the existence there of a minor faunal area of comparatively limited extent.

I am indebted to Mr. Robert Ridgway, curator, and Dr. Chas. W. Richmond, assistant curator of birds, in the National Museum, for continued courtesies during the preparation of this paper.

***Amazona albifrons saltuensis* subsp. nov.** Blue-crowned Parrot.

Type No. 164257, ♂ ad., U. S. Nat. Mus., Biological Survey Collection, from Camoa, Sonora, Mexico. Collected January 16, 1899, by E. A. Goldman.

*Distribution*.—Northern Sinaloa and southwestern Sonora, Mexico.

*Subspecific characters*.—Compared with specimens of *A. albifrons* from the coast of Oaxaca and Guerrero, the birds from southwestern Sonora may be distinguished by the greater width of blue area on crown, the strong wash of blue over back and sides of neck, and the lighter wash of same over rest of back and on all of under parts; thus giving the plumage a bluish-green cast instead of the oil-green back and apple-green under parts of the presumably typical birds from farther south. No appreciable difference in size.

*Dimensions of type*. \*—Wing 185; tail 97; culmen 25; tarsus 18.

***Antrostomus goldmani* sp. nov.** Goldman's Whippoorwill.

Type No. 164310, ♀ ad., U. S. National Museum, Biological Survey Collection, from vicinity of Mazatlan, Sinaloa, Mexico. Collected April 7, 1899, by E. A. Goldman.

*Distribution*.—Known only from the type locality.

*Specific characters*.—Most like *Antrostomus ridgwayi* but larger and paler, with the buffy collar around back of neck narrower. Tarsus feathered only on upper third.

*Color*.—Top of head and nape pale, brownish drab-gray, with a narrow median line formed of irregular black shaft streaks; feathers on sides of crown and nape with fine black shaft streaks; a grayish white stripe from top of orbit back along sides of nape; ear coverts mottled brownish, bordered below by a narrow line of white; chin and throat grayish brown with the feathers on chin finely mottled with blackish and on lower throat with narrow subterminal black bars and broad white tips; immediately back of this, a collar of golden buffy completely encircling neck; shoulders, back, rump, and upper tail coverts dark gray, finely mottled with pale brown and with distinct shaft streaks of black, heaviest on upper tail coverts; primaries dull black, with large spots of rich fulvous buffy on both webs, and mottled near tips with gray; secondaries blackish coarsely mottled with gray and fulvous buffy; outer web of outer scapulars dull blackish, finely mottled with gray, with roughly oblong black spots forming part of most of black shaft streaks; these black spots and streaks edged with buffy; inner web of inner scapulars like those already described but adjacent inner and outer webs of middle scapulars pale gray, finely mottled with darker, forming a broad, pale, longitudinal band along middle of scapulars on each side of which extend most of the oblong black shaft spots; tail above very similar to back in general color but more coarsely mottled with black; tail below dull blackish, indis-

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\* All measurements are in millimeters.

tinctly banded and coarsely mottled with gray and buff and narrowly tipped with buff; entire breast gray, finely mottled with pale brown and buffy and with fine black shaft streaks; crissum buffy with irregular black bars, coarser and fewer on under tail coverts.

*Dimensions*.—Wing 163; tail 123; culmen 13; tarsus 18.

*General notes*.—The crown of *A. goldmani* is much paler than the rest of the back and in the silky gray gloss and pattern of markings closely resembles the crown of a gray specimen of *Nyctidromus albicollis*. It has the same general type of coloration as *A. ridgwayi*, and like it has feathers only on the upper third of the tarsus. Both *A. ridgwayi* and *A. goldmani* are very distinct from *A. salvin*. The latter, although having a very narrow buffy collar around the neck, is a much darker bird with a very different pattern of markings, especially on the wings, and has the upper two-thirds of the tarsus feathered.

***Aphelocoma grisea* sp. nov. Chihuahua Jay.**

*Type* No. 164250, ♀ ad., U. S. Nat. Mus., Biological Survey Collection, from vicinity of Guachochi, in the Sierra Madre of southern Chihuahua, Mexico. Collected September 27, 1898, by E. A. Goldman.

*Distribution*.—Oak woods in Sierra Madre of southern Chihuahua, Mexico.

*Specific characters*.—Nearest *Aphelocoma woodhousei* but the head paler blue, back grayer, and crissum white.

*Color of type*.—Top of head and neck pale grayish blue approaching China blue; entire back dull gray with faint wash of blue; upper tail coverts azure blue; upper surface of wings and tail a little darker blue than crown; ears and sides of head dark gray glossed with blue, especially on cheeks; narrow superciliary streak of white extending back from upper border of orbit; chin and under side of neck to fore breast dull whitish with pale bluish gray streaks; breast and front part of flanks dingy gray shading posteriorly into the white area occupying entire crissum.

*Dimensions of type*.—Wing 138; tail 140; culmen 24; tarsus 39.

*General notes*.—*Aphelocoma grisea* may be distinguished from both *A. woodhousei* and *A. cyanotis* by the paler, grayer color of its upper parts, the obsolescence of the streaking on the under side of the neck and fore breast, and the white crissum.

***Pipilo fuscus intermedius* subsp. nov. Alamos Pipilo.**

*Type* No. 164259, ♂ ad., U. S. Nat. Mus., Biological Survey Collection, from Alamos, Sonora, Mexico. Collected December 21, 1898, by E. A. Goldman.

*Distribution*.—Coast region of southern Sonora and northern Sinaloa, Mexico.

*Subspecific characters*.—Size intermediate between *Pipilo fuscus mesoleucus* and *P. f. albicollis*. Back clearer or more ashy gray than in either *albigula* or *mesoleucus*; crown ordinarily like back with only a trace of

rufous; under surface of body much like *mesoleucus* but the flanks a little darker ashy.

*Measurements of type*.—Wing 93; tail 105; culmen 13.5; tarsus 26.

*General notes*.—The strongest character of *P. f. intermedius* is the absence of rusty rufous on the crown and the grayer back as contrasted with the rusty crown and brownish gray back of both *mesoleucus* and *albigula*.

***Cardinalis cardinalis affinis* subsp. nov. Sonora Cardinal.**

*Type No.* 164258, ♀ ad., U. S. Nat. Mus., Biological Survey Collection, from Alamos, Sonora, Mexico. Collected January 28, 1899, by E. A. Goldman.

*Distribution*.—Coast region of southern Sonora and northern Sinaloa, Mexico.

*Subspecific characters*.—Size of *Cardinalis c. igneus* from which the females may be distinguished by narrower bill, grayer upper parts, and duller or less buffy under parts; dark chin patch absent as in *igneus*. The males scarcely distinguishable from those of *igneus* except by their slenderer bills.

*Dimensions of type*.—Wing 92; tail 104; culmen 17; width of bill at base 12; tarsus 25.

*General notes*.—*Cardinalis c. affinis* is much more like *C. c. igneus* of the Cape St. Lucas region than like *C. c. superbus* of southern Arizona and northern Sonora. *C. c. superbus* is a much larger bird and the female is browner above, more buffy ochraceous below, and has a distinct dark chin patch. An adult female from Tucson, Arizona, measures: Wing 104; tail 123; culmen 19; width of bill at base 13.5; tarsus 27.

***Cardinalis cardinalis sinaloensis* subsp. nov. Sinaloa Cardinal.**

*Type No.* 164375, ♀ ad., U. S. Nat. Mus., Biological Survey Collection, from Culiacan, Sinaloa, Mexico. Collected March 18, 1899, by E. A. Goldman.

*Distribution*.—Coast plains and foothills of central and southern Sinaloa, and probably south to Colima, Mexico.

*Subspecific characters*.—Size nearly the same as that of *Cardinalis c. igneus*, but bill longer and slenderer; color of male lighter and more vivid red; color of female above, darker and grayer but with more red on wings and tail; below darker and more brownish fulvous with an indistinct dark grayish chin patch. Compared with *C. c. superbus*, size much smaller; male brighter, more carmine red; female—above, darker gray, below darker, more brownish fulvous. The female differs from that of *C. c. affinis* in its smaller size and much darker and more brownish fulvous color of under parts.

*Dimensions of type*.—Wing 87; tail 96; culmen 18; tarsus 26.

***Arremonops superciliosa sinaloæ* subsp. nov. Mazatlan Sparrow.**

*Type No.* 164388, ♂ ad., U. S. Nat. Mus., Biological Survey Collection, from vicinity of Mazatlan, Sinaloa, Mexico. Collected April 6, 1899, by E. A. Goldman.

*Distribution*.—Coast lowlands of western Mexico from Mazatlan at least to southern border of the Territory of Tepic.

*Subspecific characters*.—Similar to *Arremonops superciliosa sumichrasti*, but the median line of crown and sides of head more ashy; foreback distinctly shaded with ashy and rest of back clearer and less olive green; under parts paler and less buffy. Median and superciliary crown streaks darker ashy than in typical *superciliosa*, the rufous lateral stripes paler; chin and throat much paler and less buffy—about as in *sumichrasti*; back a little grayer.

*Dimensions of type*.—Wing 65; tail 56; culmen 13; tarsus 20.5.

*General notes*.—By a slip of the pen in the 'Auk' for April, 1898, p. 157, I placed *A. sumichrasti* as a subspecies of *rufivirgata*. In fact it is a subspecies of the quite distinct *A. superciliosa*, which (with all its subspecies) belongs to the west coast of Central America and Mexico. *A. rufivirgata* and its subspecies belong to the east coast.

***Basileuterus rufifrons caudatus* subsp. nov.** Sonora Warbler.

*Type* No. 164260, ♂ ad., U. S. Nat. Mus., Biological Survey Collection, from vicinity of Alamos, Sonora, Mexico. Collected January 3, 1899, by E. A. Goldman.

*Distribution*.—Southwestern Sonora and northern Sinaloa, Mexico.

*Subspecific characters*.—Similar to *Basileuterus rufifrons jouyi* from which it differs in the paler and more restricted rufous area on crown; rather paler gray of back; more fulvous color on crissum combined with shorter wing and longer tail and tarsus.

*Dimensions of type*.—Wing 51; tail 60; culmen 10; tarsus 23. *Type* of *B. r. jouyi*.—Wing 52; tail 56; culmen 9; tarsus 20.

***Thryothorus felix pallidus* subsp. nov.** Mazatlan Wren.

*Type* No. 164270, ♀ ad., U. S. Nat. Mus., Biological Survey Collection, from Chacala, Durango, Mexico. Collected February 27, 1899, by E. A. Goldman.

*Distribution*.—Arid tropical region of western Mexico, from northern Sinaloa and western Durango to southwestern Puebla and northern Guerrero, Mexico.

*Subspecific characters*.—Generally similar to typical *T. felix*, but slightly smaller, with upper parts less rufous and more olive brown; tail paler brown, with much more distinct black bars; under parts paler, and under tail coverts barred with dingy whitish and black instead of rufous brown and black.

*Dimensions of type*.—Wing 56; tail 53; culmen 14; tarsus 21.

*General notes*.—*Thryothorus felix* was described from southwestern Oaxaca. We have a winter specimen taken at Ometepec, Guerrero, so near the type locality both in distance and climatic conditions that I am safe in considering it typical, and have used it as such in the foregoing comparison. Numerous specimens from Tepic, Sinaloa, and western Durango agree with the type of *Thryothorus f. pallidus*.

**Heleodytes stridulus** sp. nov. Brown-backed Wren.

*Type* No. 164261, ♀ ad., U. S. Nat. Mus., Biological Survey Collection, from Sierra de Choix, northeastern Sinaloa, Mexico. Collected October 16, 1898, by E. A. Goldman.

*Distribution*.—Arid mountain slopes of northeastern Sinaloa and adjacent parts of Sonora, Mexico.

*Description of type*.—Crown blackish brown, darkest on forehead; superciliary stripe from bill to nape white, washed with fulvous brown; loreal and postocular stripe blackish; cheeks from gape dingy whitish; malar stripe black; sides of neck dingy whitish, streaked with dull blackish and thinly washed with dull fulvous; back and scapulars burnt umber brown, marked with irregular white shaft streaks and obscure blackish spots; upper tail coverts transversely barred with umber brown, black and whitish; outside of wings marked with spots of umber brown, black and whitish; middle tail feathers ashy brown, indistinctly and narrowly barred with blackish; lateral feathers black, with dingy ashy tips and a series of brownish white spots along outer webs; chin, throat, breast, and middle of belly white, faintly washed with brown and spotted on breast and flanks with black; flanks posteriorly and entire crissum cinnamon brown, brightest on under tail coverts.

*Measurements of type*.—Wing 75; tail 76; culmen 19.5; tarsus 24.

*General notes*.—This species is nearest *H. gularis*, from which it is easily distinguished by the blackish brown crown, blackish postocular stripe, and darker brown back. The black spots on breast and flanks are rounded instead of being mainly pointed anteriorly (and thus subtriangular), as in *H. gularis*. Typical specimens of *H. gularis* in the Biological Survey Collection from the Sierra Nevada de Colima, southern Jalisco, and from the Sierra Madre of southern Sinaloa and the Nayarit Mountains of Tepic, just west of Bolaños, outline the known range of this species, and the specimens from the mountains of Sonora referred to *H. gularis* by Salvin and Godman (Ibis, 1889, p. 235) are, no doubt, referable to *H. stridulus*.

**Myadestes obscurus cinereus** subsp. nov. Sonora Solitaire.

*Type* No. 164262, ♀ ad., U. S. Nat. Mus., Biological Survey Collection, from mountains near Alamos, Sonora, Mexico. Collected January 3, 1899, by E. A. Goldman.

*Distribution*.—Arid mountains of southern Sonora and adjacent part of Sinaloa, Mexico.

*Subspecific characters*.—Most like *M. yadestes o. insularis* but with the ashy gray of upper parts even paler than in that form and extending farther down over fore back: rump and middle tail feathers clearer ashy and interscapular area less suffused with brown. Under parts much as in *M. o. occidentalis* but clearer ashy, with white area on abdomen more restricted than in *insularis*.

*Measurements of type*.—Wing 104; tail 104; culmen 11.5; tarsus 20.

*General notes*.—This form equals *Myadestes o. occidentalis* in size but is

much paler, and is, in fact, the palest known subspecies of *M. obscurus*. The present record extends the range of this species far north along the west coast of Mexico. *M. townsendi* is the resident species in the high pine forests of the Sierra Madre of northwestern Mexico, the present form belonging to the lower, drier ranges between the Sierra Madre and the coast.

***Catharus olivascens* sp. nov.** Chihuahua Thrush.

Type No. 164263, ♂ ad., U. S. Nat. Mus., Biological Survey Collection, from the Sierra Madre, Chihuahua (65 miles east of Batopilas), Mexico. Collected September 30, 1898, by E. A. Goldman.

*Distribution*.—Known only from the type locality.

*Description of type*.—Top of head and nape raw umber brown; sides of head and neck hair brown, underlaid with pale buffy; back, including scapulars and rump, olive brown, contrasting with color of crown and nape; outside of wings and upper tail coverts similar to, but browner than back; tail grayish brown washed on exposed parts with tawny olive; chin, throat and upper part of breast, pale creamy buff, streaked or mottled with hair brown shaded with olive; rest of breast, abdomen, and under tail coverts white; upper part of flanks pale grayish brown.

*Measurements of type*.—Wing 91; tail 77; culmen 13; tarsus 31.

*General notes*.—This species is most closely related to *Catharus occidentalis fulvescens* Nelson, but the colors of the upper parts are much more olivaceous, the throat and middle of breast deeper buffy with heavier gray markings, and the wash of gray on the sides of the body much more restricted, leaving a larger area of pure white. The bill is longer and slenderer and the tarsus shorter. The presence of a species of *Catharus* in Chihuahua extends the range of the genus far north of any former record, and was unexpected after my unsuccessful efforts, during the summer of 1898, to find the bird in Durango and extreme southern Chihuahua.





PROCEEDINGS  
OF THE  
BIOLOGICAL SOCIETY OF WASHINGTON

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TWO NEW GLOSSOPHAGINE BATS FROM THE  
WEST INDIES.\*

BY GERRIT S. MILLER, JR.

Examination of material in the United States National Museum proves that there are at least three species of the Glossophagine genus *Phyllonycteris* in addition to the slightly known *P. poeyi*. One of these, *P. sezekorni* Gundlach,† is confined to Cuba, the second occurs in the Bahamas, and the third is thus far known from Puerto Rico only.‡ To the kindness of Dr. J. A. Allen I owe the opportunity of examining two skulls of *Phyllonycteris sezekorni*.

The three species may be distinguished by the following synopsis:

Zygomatic arch incomplete; braincase high but forming no angle with dorsal outline of rostrum; rim of anterior nares thick, not flaring; no distinct lachrymal swellings; depth of mandible about one-sixth length; crown of first lower molar only slightly longer than that of first premolar; color light yellowish brown.....*P. sezekorni*.

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† Monatsber. K. Preuss. Akad. Wiss., Berlin (1860), p. 818, December, 1860.

‡ Since this paper has been in press, Mr. D. G. Elliot has sent me for examination the *Phyllonycteris* from San Cristobal, Santo Domingo, which he recorded in 1896 as *P. poeyi* (Field Columbian Museum Publication 11, Zoölogical Series, I, No. 3, p. 82, May, 1896). The single skin represents a species closely related to *P. bombifrons* of Puerto Rico, but probably distinct. In the absence of satisfactory material it would be useless to attempt to define the form.

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Zygomatic arch complete; braincase forming an angle with dorsal outline of rostrum; rim of anterior nares variable; lachrymal region distinctly swollen; depth of mandible about one-seventh length; crown of first lower molar nearly twice as long as that of first premolar; color variable.

Braincase rising above plane of rostrum at angle of about 12°; rim of anterior nares thick, not flaring; teeth large; anterior border of tragus entire; back light clay color ..... *P. planifrons*.

Braincase rising above plane of rostrum at angle of about 30°; rim of anterior nares thin, distinctly flaring; teeth small; anterior border of tragus with several fleshy projections near tip; back dark brown..... *P. bombifrons*.

#### ***Phyllonycteris planifrons* sp. nov.**

*Type*, adult ♂ (in alcohol), No. 62517, United States National Museum, collected at Nassau, New Providence, Bahamas, March 18, 1886, by James E. Benedict.

*General characters*.—See synopsis.

*Ears*.—The ears are moderately long; laid forward they reach about three-fourths of the distance from eye to nostril. Anterior border of conch strongly convex immediately above base, then nearly straight to narrowly rounded off tip. Posterior border faintly concave immediately below tip, convex through lower half. The posterior border terminates abruptly close in front of meatus, and almost directly below anterior base. Six or seven transverse ridges on inner side of conch near posterior border. A small but conspicuous wart on cheek in front of lower base of ear. Anterior border of tragus much thickened, nearly straight, though slightly convex near middle and slightly concave below tip. Tip pointed. Posterior border with four jagged projections, of which the two lower are largest and the two upper occasionally obsolete.

*Muzzle and chin*.—Main portion of noseleaf oval, considerably broader than high, ill defined over upper lip, the free edge finely crenulate. At middle of upper part of free edge is a well defined upright projection, the height of which above general outline of oval is about equal to distance between inner borders of nostrils.

Nostrils near outer edges of noseleaf, opening upward, forward and slightly outward.

Behind the noseleaf and separated from it by a deep groove is an irregular but well-developed horseshoe-shaped ridge, the ends of which blend with the glandular upper lip.

Chin divided by a deep groove, narrow below, wide above, from the sides of which spring four to six small, fleshy projections.

*Membranes*.—The membranes are thick and leathery; the wings and propatagium broad and ample; the uropatagium greatly reduced (only 10 mm. wide at base). Propatagium extending along forearm to join

thumb at distal end of metacarpal. The membranes are practically naked throughout, as the fur of the body reaches the wings (both above and below) in a narrow line only.

*Feet.*—The foot is long and strong, about two-thirds length of tibia. Toes essentially equal in length, the first and fifth slightly shorter than the others. Claws large and sharp, nearly one-third as long as rest of foot. Calcar distinct but reduced to a mere stub 3 mm. in length.

*Tail.*—Tail slightly longer than foot, a little less than half free from membrane.

*Fur and color.*—The fur is loose in texture, and only moderately long (about 10 mm. at middle of back). It is closely confined to body, scarcely reaching wings. That of head covers external basal fourth of ears. Face densely hairy as far forward as ridge behind noseleaf. Chin and noseleaf naked. Lips and ridge behind noseleaf sprinkled with fine, short hairs.

Color of two skins (topotypes) collected June 3, 1884, by C. J. Maynard (Nos. 85 and 86, Miller collection): fur of back whitish gray through basal half, then light clay color faintly tinged with pinkish buff. The pale bases of the hairs appear irregularly at the surface. Ventral surface pinkish buff, the hairs grayish at base. Ears, membranes, and feet light brown. After thirteen years' immersion in alcohol the color of the type does not differ appreciably from that of these skins.

*Skull.*—The skull of *Phyllonycteris planifrons* differs from that of *P. sezekorni* most noticeably in the presence of very slender but complete zygomatic arches. The rostrum is slightly broader and flatter and the braincase smaller relatively to the size of the skull. The facial profile is straight from external nares to base of proencephalon, where it rises at an angle of about 12°. Proencephalon small, indistinctly marked off from very large mesencephalon. Metencephalon small and slightly outlined. Lachrymal region abruptly swollen. Antorbital foramen placed obliquely over posterior part of second premolar. Bony palate slightly arched, its general form nearly rectangular, the width between penultimate molars about half length. Vacuities behind incisors smaller than in *P. sezekorni*, but distinct. Pterygoids long, the distance from hamular to posterior molar slightly greater than length of tooth row behind canine. The pterygoids are strongly hollowed from within; and the interpterygoid fossa is partly closed in immediately behind the bony palate by the thin shelf-like edges of the pterygoids. Ventral aspect of roof of posterior nares flat. A slight depression on each side of the faint median ridge on basioccipital between audital bullæ. Audital bullæ small and round, their greatest diameter about equal to least width of palate between second premolars. Rim of external nares thick, not flaring. Mandible slender, the depth contained about seven times in greatest length.

The skull of the type measures: greatest length 25; basal length 22; basilar length 20; zygomatic breadth 11; interorbital breadth 4.8; lachrymal breadth 6; mastoid breadth 11; fronto-palatal depth 3.4; depth of braincase from highest point to level of audital bullæ 9.6; maxillary

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tooth row (exclusive of incisors) 8.4; mandible 16.4; mandibular tooth row (exclusive of incisors) 9.

*Teeth.*—The teeth are slightly larger than in *P. sezekorni* or *P. bombifrons*. Crown of first upper molar nearly equal in length to that of second and third together. First upper premolar minute, usually closely wedged between canine and second premolar. Second premolar larger than second molar. First lower molar nearly double as long as first lower premolar; second premolar slightly larger than first, which is about equal to third molar.

*Measurements* (type specimen).—Total length 78; tail vertebrae 17; tibia 22; foot 14; forearm 47; thumb 12; second finger 35; third finger 82; fourth finger 62; fifth finger 64; ear from meatus 19; ear from crown 15; width of ear 13.6; tragus 8.2; width of tragus at anterior base 2.2; height of noseleaf from upper lip 4.6; width of noseleaf 5.

*Specimens examined.*—One hundred and twenty-four (2 skins), all from the same limestone cave a few miles from the city of Nassau.

***Phyllonycteris bombifrons* sp. nov.**

*Type*, adult ♂ (in alcohol), No. 86274, United States National Museum, collected in a limestone cave near Bayamon, Province of San Juan, Puerto Rico, January 18, 1899, by Paul Beckwith.

*General characters.*—See synopsis.

*Ears.*—In size and form the ears are as in *P. planifrons*. Tragus shorter and broader than in *P. planifrons*, the anterior border strongly convex, and with from one to three pointed outgrowths above middle. Posterior border much more conspicuously denticulate than in *P. planifrons*.

*Muzzle and chin.*—The muzzle and chin are essentially as in the Bahaman species, but the ridge back of the noseleaf is separated from the latter by a much broader groove, and the fleshy outgrowths from the sides of the groove in chin are more conspicuous.

*Membranes, feet, tail, and fur* as in *P. planifrons*.

*Color.*—Both fur and membranes are much darker than in *P. planifrons*. In a specimen (No. 86270) skinned after only two months' immersion in formalin and alcohol, the fur of the dorsal surface is whitish gray through basal two thirds, then mars brown to tip. Ventral surface pale wood brown. Ears, feet, and membranes dark brown.

*Skull.*—The skull of *Phyllonycteris bombifrons* differs from that of *P. planifrons* in its shorter, narrower, more rounded rostrum, and larger, much more highly arched braincase. The proencephalon rises above the plain of the rostrum at an angle of about 30°. Lachrymal swellings well developed. Audital bullae smaller than in *P. planifrons*, the greatest diameter of each considerably less than least width of palate between second premolars. *Pterygoids* slightly shorter than in *P. planifrons*. Rim of external nares thin and noticeably flaring. Mandible slender.

The skull of the type measures: greatest length 24.4; basal length 22; basilar length 19.8; zygomatic breadth 12; interorbital breadth 5; lachrymal breadth 6; mastoid breadth 11.4; fronto-palatal depth 3; depth

of braincase from highest point to level of audital bullæ 10.4; maxillary tooth row (exclusive of incisors) 8; mandible 16; mandibular tooth row (exclusive of incisors) 9.

*Teeth*.—Except for their somewhat smaller general size, the teeth of *Phyllonycteris bombifrons* do not differ appreciably from those of *P. planifrons*.

*Measurements* (type).—Total length 78; tail vertebrae 14; tibia 22; foot 14; forearm 48.4; thumb 14; second finger 38; third finger 81; fourth finger 65; fifth finger 64; ear from meatus 18; ear from crown 14; width of ear 13; tragus 7; width of tragus at anterior base 2.2; height of noseleaf from upper lip 4.6; width of noseleaf 5.

*Specimens examined*.—Fourteen, all from the type locality.



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A NEW POLAR HARE FROM LABRADOR.\*

BY GERRIT S. MILLER, JR.

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Certain marked discrepancies are apparent in the measurements of Polar Hares from Labrador and Newfoundland tabulated under the name *Lepus arcticus bangsi* by Mr. Samuel N. Rhoads in his recent 'Synopsis of the Polar Hares of North America.'† They are, however, passed by without comment. On examining the specimens in the United States National Museum, together with a few lent me by Mr. Outram Bangs, I find that these differences are correlated with others, both cranial and external, and that the Labrador Polar Hare is readily separable from true *Lepus bangsi* (Rhoads) of Newfoundland. Its relationship to the Polar Hare of Baffin Land, *Lepus arcticus* Ross, is, through the loss of Mr. Kumlien's specimens, less easily determinable. *Lepus arcticus*, however, according to the best testimony, never assumes a complete dark summer coat; while the single skull that I have examined differs from that of any of the Labrador specimens. As the Polar Hare of Labrador cannot be identified with either *Lepus arcticus* or *Lepus bangsi* it may stand as:

***Lepus labradorius* sp. nov.**

1896. *Lepus arcticus bangsi* Rhoads, American Naturalist, XXX, p. 253. March, 1896 (part). Type locality, Codroy, Newfoundland.  
1896. *Lepus arcticus bangsi* Rhoads, Proc. Acad. Nat. Sci. Philadelphia, p. 365. August 4, 1896 (part).

*Cotypes*: Skin No. 14149, United States National Museum, collected at Fort Chimo, Ungava, Labrador, September 28, 1882, by Lucien M. Turner

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† Proc. Acad. Nat. Sci. Philadelphia (1896), pp. 351-376.

(original number 1180); skull No. 32132, United States National Museum, same locality and collector, no further data (original number 2326).

*General characters.*—Most like *Lepus bangsi* (Rhoads) from Newfoundland, but with shorter hind foot and longer ears. General color of dorsal surface in summer pelage clear hair brown instead of dull broccoli brown as in *L. bangsi*. Audital bullæ more inflated than in *L. bangsi*. Differs from the *Lepus arcticus* Ross of Baffin Land in the completely developed dark summer coat, and apparently in cranial characters also.

*Color.*—General color of dorsal surface hair brown tinged with bluish gray and frosted with whitish. Head clear, pale, hair brown, lightest on cheeks and darkest on crown and forehead. Ears grizzled black and hair brown anteriorly, whitish posteriorly, black at extreme tip. Sides and rump clear gray (Ridgway, Nomenclature of Colors, Pl. II, No. 8). Belly dull white. Hind feet white above, tinged with brown over bases of toes. Front feet white, strongly tinged with brown. Soles of all four feet light umber brown. Tail snowy white.

*Skull.*—The skull of *Lepus labradorius* exactly resembles that of *L. bangsi* except in the form of the audital bullæ. These are so much inflated that they rise (when the skull is held upside down) conspicuously above the surface of the basioccipital, and slightly above the level of the highest point of the occipital condyle. In *L. bangsi* the bullæ rise very slightly above the surface of basioccipital, and generally not to level of condyle. The ventral exposure of the bullæ is in *Lepus labradorius* considerably longer than broad, while in *L. bangsi* the length and breadth are nearly equal.

*Measurements.*—Type: \* hind foot 140; ear from crown 100; ear to tip of hairs 108. Another specimen (No. 14793, U. S. National Museum): hind foot 142; ear from crown 105; ear to tip of hairs 110.

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\*The type of *Lepus bangsi* measures: total length 626; tail vertebrae 63; hind foot 160; ear from crown 85. (Rhoads.)



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*CHAMÆA FASCIATA* AND ITS SUBSPECIES.

BY WILFRED H. OSGOOD.

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Among the Wren-Tits in the collection of the U. S. National Museum\* is a single specimen (No. 3339) which formed part of the original Baird collection and which is labeled in Prof. Baird's writing ' *Parus fasciatus* California, Wm. Gambel.' This is the only known specimen of *Chamæa* collected by Gambel, and as such Mr. Ridgway has for some time considered it the type of *Chamæa fasciata* Gambel. The exact locality from which it came is unknown but its characters show conclusively that it belongs to the pale southern form rather than to the dark northern one. This being the case, *Chamæa f. henshawi* becomes a synonym of *C. fasciata*, and it is necessary to provide a new name for the northern coast form heretofore assumed to be typical *fasciata*. The status of the two forms may be summarized as follows:

***Chamæa fasciata* Gambel.** Pallid Wren-Tit.

*Parus fasciatus* Gambel, Proc. Acad. Nat. Sci., Phila., p. 265, 1845.

*Chamæa fasciata* Gambel, Proc. Acad. Nat. Sci., Phila., p. 154, 1847.

*Chamæa fasciata henshawi* Ridgway, Proc. U. S. Nat. Mus., V, 13, June 5, 1882. (Type from Walker Basin, California.)

Type from [southern] California, No. 3339 U. S. Nat. Mus. Collected by Wm. Gambel.

Distribution.—Southern coast and interior of California, including coast valleys and foothills from San Francisco Bay south to northern Lower

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\* The Wren-Tits in the U. S. National Museum collection were kindly placed at my disposal by Mr. Robert Ridgway, Curator of Birds.

California; interior valleys and slopes north to head of the Sacramento Valley. Upper Sonoran zone.

*Description of type.*—Upper parts pale hair brown, shading into grayish on nape and top of head and into olivaceous on rump; flanks pale brownish olive; sides of head, neck and shoulders ashy, slightly paler than crown; a small white spot above and below eye; throat and breast cinnamon rufous; sides washed with cinnamon; belly yellowish white medially; inner web of primaries and secondaries edged with whitish; under wing coverts and axillars pale cinnamon rufous.

*Measurements of type.*—Wing 59; tail 83; exposed culmen 11; tarsus 25.

*Remarks.*—The type of *C. fasciata*, though slightly darker than the type of '*henshawi*,' exactly represents the average condition of the southern and interior form. Specimens from the Sacramento Valley, from San Bernardino county and Pasadena do not differ from it in any way. It is possible that the type was taken in San Bernardino County, since it agrees perfectly with specimens from there and Gambel must have passed through that region. Even if the type were not available it would be best to use the name for the southern form, since so far as known, Gambel's collecting in California was confined to the region south of San Francisco.

***Chamae fasciata phæa* subsp. nov. Coast Wren-Tit.**

*Type* from Newport, Yaquina Bay, Oregon, ♂ ad., No. 164256, U. S. Nat. Mus., Biological Survey Collection. Collected March 14, 1899, by B. J. Bretherton. Orig. No. 2405.

*Distribution.*—Coast of Oregon and California from Astoria to Nicasio. Transition zone.

*Description of type.*—Upper parts almost uniform sepia, darkest on head, becoming bister on rump; tail bister with tinge of olivaceous; flanks about like rump, grading insensibly into sides; lores, cheeks and sides of head dark ashy; a white spot above and below eye; throat, breast, and sides deep brownish rufous; limited area in middle of belly buffy yellow; throat and breast obscurely streaked with dusky; inner web of primaries and secondaries edged with white; under wing coverts and axillars pale cinnamon rufous.

*Measurements of type.*—Wing 60; tail 79; exposed culmen 10; tarsus 25.

*Remarks.*—Intergradation between typical *C. fasciata* and *C. f. phæa* occurs in the vicinity of San Francisco Bay. Among the few specimens examined from the region immediately south of San Francisco (Santa Clara, Santa Cruz, etc.) are individuals referable to each form, though the majority are nearest to *C. fasciata*.

PROCEEDINGS  
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DESCRIPTION OF A NEW LEMMING MOUSE FROM  
THE WHITE MOUNTAINS, NEW HAMPSHIRE.

BY EDWARD A. PREBLE.

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During the latter part of June, 1898, I collected a few small mammals near the village of Fabyans, in the White Mountains of New Hampshire, a short distance west of the base of Mt. Washington. Among these specimens is a small Lemming Mouse, at first supposed to be *Synaptomys fatus*,\* which it greatly resembles externally. An examination of the skull, however, shows the animal to belong to *Mictomys*, a subgenus hitherto unrecorded from the eastern United States.†

On comparing this specimen with the type of *Synaptomys* (*Mictomys*) *innuitus*, it was at once apparent that it represented an undescribed form, which may be characterized as follows:

***Synaptomys* (*Mictomys*) *sphagnicola* sp. nov.**

*Type* No. 96543, ♂ adult, U. S. Nat. Museum, Biological Survey Collection. Collected at Fabyans, New Hampshire (near base of Mt. Washington), June 29, 1898, by Edward A. Preble. Original number 2402.

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\* Described by Mr. Outram Bangs (Proc. Biol. Soc. Wash., X, p. 47, 1896), from Lake Edward, Quebec, and since recorded from Maine, New Hampshire, and New Brunswick.

† The following references comprise all the published eastern records for *Mictomys*, each referring to a single specimen:

True, Proc. U. S. Nat. Mus., XVII, No. 999, p. 242 (advance sheet Apr. 26), 1894. Original description of *Mictomys innuitus* from Ft. Chimo, Ungava, Labrador.

Bangs, Proc. Biol. Soc. Wash., XI, p. 238, 1897. Record of a specimen of *Synaptomys* (*Mictomys*) *innuitus* (not typical) from Hamilton Inlet, Labrador.

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*General characters.*—Larger than *S. inuitus*, with larger skull and longer hind foot and tail.

*Color of type.*—Upper parts sepia brown, quite thickly interspersed with black-tipped hairs, the fur basally blackish slate; each side gland marked with white; under parts grayish white; inside of ears slightly darker than general color of upper parts; a few hairs at base of ears and on sides of cheeks, light chestnut; tail quite sharply bicolored, the upper and lower sides concolor with body.

*Cranial characters.*—Compared with the type of *Synaptomys inuitus*, which is approximately of the same age, the skull of *S. sphagnicola* is much larger and longer; interorbital constriction considerably longer and narrower; rostrum longer and stouter; braincase more lengthened posteriorly; posterior production of zygomata straighter; incisive foramina

much larger and slightly longer proportionally; post-palatal pits deeper and median ridge correspondingly conspicuous; audital bullae longer and more rounded; pterygoids more diverging; mandible larger and stouter, with condylar processes broader proportionally.

*Dental characters.*—Compared with *S. inuitus*, the molars are heavier and molar series considerably longer; enamel pattern of molars not essentially different, though the posterior prism of the last upper molar is more triangular. Inner faces of the upper incisors much excavated medially, with the edges

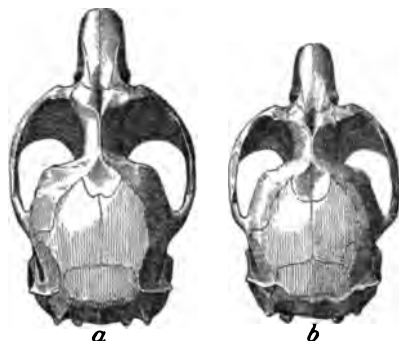


FIG. 3.—a, Type skull of *Synaptomys* (*Mictomys*) *sphagnicola*; b, type skull of *Synaptomys* (*Mictomys*) *inuitus*.  $\times 1\frac{1}{2}$ .

exterior to the sulci about one millimeter longer than remaining portion of the teeth, and ending in sharp points. Enamel faces of incisors paler orange than in the type of *S. inuitus*.

*Measurements.*—Type of *S. sphagnicola* (in flesh): total length 132; tail vertebrae 24; hind foot 20. Type of *S. inuitus* (in alcohol): total length 115; tail vertebrae 17; hind foot 17.5.

*Cranial measurements of type.*—Occipito-nasal length 27.5; basilar length 26; zygomatic breadth 16; mastoid breadth 12; interorbital constriction 28; length of nasals 8; length of incisive foramina 5.5; upper molar series, 7. Type skull of *S. inuitus* (No. 24729, U. S. Nat. Mus.): occipito-nasal length 19.6; basilar length 18.3; zygomatic breadth 15; mastoid breadth 11.5; interorbital constriction 3.1; length of nasals 6.3; length of incisive foramina 4.8; upper molar series 6.5.

*General remarks.*—The discovery of a species of *Mictomys* in the White Mountains, within the limits of the Canadian Zone, and at a comparatively low altitude (about 1,600 feet) is one of the many surprises that mod-

ern methods of collecting have brought to light, even in this thickly settled region. The type and only known specimen was taken near the banks of a small stream (called on some maps Dartmouth Brook), which leisurely winds its way through a piece of swampy ground well grown up to alders and other small trees, just before losing itself in the noisy Ammonoosuc. The carriage road leading from Fabyans to the base of Mt. Washington crosses the brook at this point after covering about a mile of its course. To the left of this road, where my collecting was done, the ground is swampy and quite densely carpeted with moss, through which spring many grasses and swamp-loving plants, overtopping, to a great extent, the logs, stumps, and fallen trees with which the ground is strewn.

My traps, set here for three nights, captured numerous specimens of meadow mice (*Microtus*), woodmice (*Peromyscus*), short-tailed shrews (*Blarina*), red-backed mice (*Erotomys*), two species of jumping mice (*Zapus hudsonius* and *Z. insignis*), in addition to the *Synaptomys* here described. The *Synaptomys* was taken in a runway in the moss, beneath a small fallen tree.

Whether this species is a wanderer from the Hudsonian Zone on the neighboring mountains, guided thence by that ideal highway, a mountain stream, or whether it is a regular inhabitant of the Canadian Zone throughout this region, is an interesting question, to be solved by future investigations.



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THE EYE OF *BYBLIS SERRATA*.

BY SYLVESTER D. JUDD, PH. D.

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*Byblis serrata* is an Amphipod Crustacean, which belongs to the family *Gammaridae*, but has totally different eyes from *Gammarus*. A pair of these eyes projects from either side of the cephalon and any one of them calls to mind the vertebrate eye, because it has a biconvex lens and a fluid-filled space with a retina below. A section through the chief axes of the eye of *Byblis* would first show a large lens, which has been secreted in concentric shells by a thickened layer of lentigen, Fig. 4, *l*, continuous on either side with the thinner hypodermis *h*, which is gorged with scarlet pigment that envelops the eye like a cornucopia, thus shutting out all the rays that might reach the retina without first passing through the lens. Under the lentigen is a humor space, *s*. Below and proximal to this space is a layer of columnar cells, *x*, which is continuous on either side with the hypodermis. This layer of cells has secreted a strong cuticula on its outer boundary, which borders on the space, and just proximal to this layer are the omatidia (which, of course, lack the corneal cuticula). The most distal element of an omatidium is a granular columnar body (cell product), *r*. Below and proximal to this body, the remainder of the omatidium with its refractive cone and retinula is practically identical with the omatidium of *Gammarus*, minus of course, the corneal cuticula, for in the retinula of both crustaceans there are five retinal cells with pigment and four rhabdomeres.

METHODS.

The material employed in studying the eye of *Byblis serrata* was obtained at Mr. Alexander Agassiz's laboratory, at Newport,

R. I., during the summer of 1893, by skimming the surface of Narragansett Bay with a tow-net at night. Various killing reagents were tried, but the majority of specimens used and those giving the best results were killed in Kleinenberg's picro-sulphuric acid. Sections were cut on a Minot-Zimmerman microtome and stained with Kleinenberg's hematoxylin diluted with two parts of 70 per cent alcohol, and then decolorized in acid alcohol for ten minutes. This work was done under the direction of Dr. E. L. Mark, of Harvard University.

#### STRUCTURE OF THE EYE.

*Byblis serrata* possesses two pairs of crater-like eyes. One pair is a little anterior to the other, and also somewhat nearer the sagittal plane of the animal. The axis of the anterior pair makes a very acute angle with the chief axis of the body, pointing forward and upward. The ventral pair of eyes points downward and backward. In the living animal both pairs of eyes have a bright red appearance, owing to the presence of a large amount of red pigment surrounding the lens.

The component parts of the eye are best seen in sections passing through the chief axis. Beneath the thickened cuticula which constitutes the single lens is the succession of cell layers and cell products, which collectively form a roughly spherical mass, connected at its deep end by nerve fibers with the optic ganglia. Unlike the eyes of most Crustacea, which are the type known as compound eyes, in which clusters of cells called ommatidia, acting independently of one another, are provided each with its own proportion of modified cuticula, the eyes of *Byblis*, although composed of clusters of cells, in some ways comparable with ommatidia, nevertheless have but a single lens, so that they have a superficial resemblance to the eyes of spiders and other arachnids.

After I had studied this new and peculiar type of eye in detail, Della Valle's paper\* on the '*Gammaridae* of the Gulf of Naples' appeared, containing a figure and description of this same type of eye. The amphipod studied by Della Valle was *Ampelisca*, a genus closely allied to *Byblis*, but the author had not been able to resolve the ommatidium into its separate elements. In *Ampelisca*, as shown by Della Valle's figure, the rods and cones differ slightly in shape from those of *Byblis*. Further, there is no pigment in the hypodermis adjoining the lens. In the lentigen of *Ampelisca* the nuclei are proportionately much larger than in *Byblis*, and the

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\*A complete bibliography of the literature on the eyes of amphipods will be found at the end of Dr. G. H. Parker's masterly paper entitled 'The Compound Eyes in Crustaceans' (Bull. Mus. Comp. Zool., XXI, 1891). The only recent histological paper on the eyes of amphipods of the family *Gammaridae* is in Antonio Della Valle's '*Gammarini del Golfo di Napoli*' (Fauna und Flora des Golfes von Neapel, XX, pp. 108-112, Tav. 46, Figs. 4-6, 1893).



lens shows no stratification. But the great and important differences are that the eye of *Ampelisca* has no humor space, lacks the middle layer of the eye of *Byblis*, while the latter possesses pigment, middle layer, and fluid-filled space.

#### DETAILS OF HISTOLOGICAL ELEMENTS OF THE EYE.

*Lens*.—The lens is about the same size in each of the four eyes. Its outline is almost exactly circular in a surface view, and the curvature of the superficial and deep surfaces is nearly the same, Fig. 4, *len*. The lens, which is only a modification of the cuticula, shows even more plainly than the latter its composition of successive layers, the markings being as is commonly the case in lenses which are strongly convex, more or less concentric.

*Lentigen*.—There are three distinct layers beneath the lens, which in passing from the surface to the deeper portions I shall call respectively lentigen, middle layer, and retina. The lentigen consists of a single layer of elongated cells which radiate more or less regularly from the lens as a center, Fig. 4, *l*. They are of unequal lengths, those of the center being longest, and those nearer the margins of the lens successively shorter, so that the deep surface of the lentigen is usually hemispherical with a

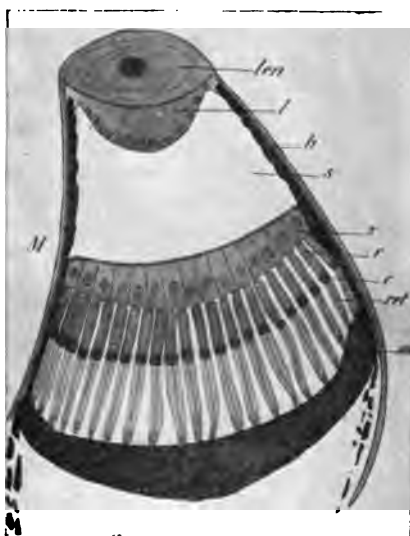


FIG. 4.—Diagrammatic section of right eye of posterior pair, slightly obliquely transverse to chief axis of body: *len*, lens; *l*, lentigen; *h*, hypodermis; *s*, space; *x*, middle layer of cells; *r*, rods; *c*, cones; *ret*, retina; *nu*, nuclear region of retina.  $\times 350$ .

tendency to a conical form. The transition to the unmodified hypodermis is nevertheless quite abrupt. The nuclei of the lentigen cells are closely crowded in a single layer at the deep surface of the lentigen—often so closely that they are nearly twice as long as broad. They are granular and have distinct nuclear membranes. The hypodermis underlying the cuticula that surrounds the lens is filled with roughly spherical granules of pigment. The hypodermal cells form a single layer of epithelium, but the pigment obscures this structure to such an extent that it is almost impossible to make out the cell boundaries. In some sections, where

this layer has been ruptured, nuclei are found which are supplied with a well defined membrane surrounding granular contents. So far as the nuclei are concerned, these pigmented hypodermal cells do not differ materially from the adjacent hypodermal cells that are lacking in pigment, Fig. 5, *h*.

*Space*.—Below the lentigen is a large space, which, in the living animal, is probably filled with fluid, for in none of my preparations is there any

trace of structural elements. A conception of the form of this space may be obtained by taking a truncated cone of plastic modeler's clay and thrusting into the truncated surface a sphere, and supposing that there is a convexity corresponding to this hemispherical depression bulging out from the base of the cone. This modified truncated cone (the *space*) has its base formed by the slightly curving distal surface of the cells of the *middle layer*, Fig. 4, *x*, and the truncated surface is depressed by the inwardly projecting hemispherical lentigen, Fig. 4, *l*.

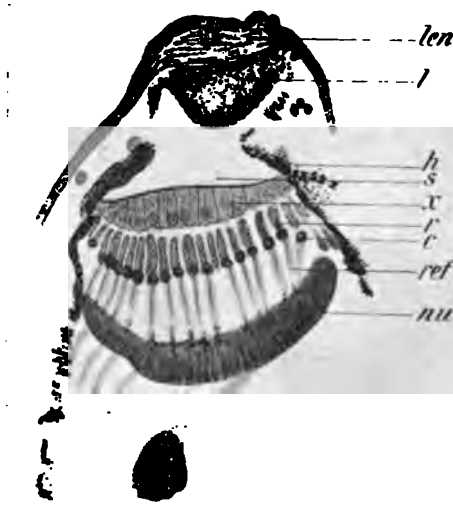


FIG. 5.—Section of left eye of the posterior and ventral pair, transverse to axis of body. Lens crinkled and hypodermis ruptured (abbreviations as in Fig. 4).  $\times 300$ .

artificially produced by shrinkage and consequent separation of the lentigen from the middle layer of cells is sufficiently evident from the constancy of its presence and form, but even more certainly from the fact that the deep surface of the lentigen and the outer surface of the middle layer cannot be imagined to have been in contact, for if they had been, such separation would have produced ragged ruptures and given conditions not shown in my series of slides.

*Middle layer*.—Below and proximal to the *space* is a single layer of columnar cells, Fig. 4, *x*. Like the lentigen, this layer is thickest in the middle, and diminishes very gradually and uniformly in thickness toward the margin. The contents of these cells are granular. The nuclei are situated in the proximal ends of the cells, and have coarsely granular contents and very faint, if any, nuclear membranes. The cells have remarkably well-defined cell walls. That this layer was not attached to and subsequently torn away from the lentigen by the microtome knife seems to be clearly shown by the fact that this middle layer has secreted on its distal surface bordering the space a thick cuticular-like structure.

Turning now to the parts of the eye lying proximal to the middle layer of cells, we notice that in all these deeper portions, which apparently correspond to the rods, cones, and retinulae of Della Valle, there seem to be no nuclei, except those lying at the proximal or bottom part of the eye, which is clearly the nuclear region of the retina. The ommatidia embrace at least the rods, cones, and retinulae.

*Rods*.—The rods lie immediately beneath and proximal to the middle layer of cells, from which they are separated by a distinct line. The rods, Fig. 4, *r*, are somewhat more numerous than the cells in the middle layer. They are columnar, about as tall as the longest cells of the middle layer, but some of the marginal ones are shorter. The rods are coarsely granular. In oblique frontal sections through the chief axis of the eye there is an indication that each rod may possibly be made up of two parts.

*Cones*.—Beneath and proximal to each rod, and in close connection with it, is a crystalline cone, Fig. 4, *c*, which has a rounded cubical form and is highly refractive. Each cone is homogeneous except for a white space that usually occurs within its body. These spaces often have the appearance of more or less spheroidal cavities or vacuoles, but such vacuoles generally indicate the plane of separation between the two component parts of the crustacean cone. This apparent resolution of the cone into two parts seems to be indicated in cross-sections by two opposite sharp indentations of the outline.

*Retinulae*.—Closely adhering to each cone is a bundle of five fusiform elements, Fig. 4, *ret*. The bundle at a deep level becomes resolved into its separate elements, and at a still deeper level closely packed nuclei of the retinula cells are found, Figs. 4 and 5, *nu*. These nuclei, which are completely filled with deeply stained granules, are flask-shaped. A cross-section through a fusiform bundle shows five granular retinula cells clustered about a highly refractive rhabdome composed of four rhabdomeres. At the place where the bundles are resolved a considerable amount of pigment is seen. In a cross section five  $\mu$  thick each retinal cell contains about two grains of pigment. Nerve fibers have been traced from the optic ganglia to the region of the nuclear layer of the retina, but the exact connection with the retinal cells was not clearly seen.

#### CONCLUSIONS.

The eye of *Byblis serrata*, with its large lens, humor space, and complex ommatidia, seems to be a compound eye built on the general plan of a simple ocellus, but also furnished with a space whose function may be like that of the vitreous humor space of the vertebrate eye. The true significance of this peculiar eye awaits the deft touch of the embryologist, who, in taking up this sense organ, will certainly enter a field where much is to be learned concerning the morphology of the arthropod eye.



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A NEW FOSSIL BEAR FROM OHIO.\*

BY GERRIT S. MILLER, JR.

The United States National Museum has recently purchased from Mr. W. G. Roberts, of Middletown, Ohio, the skull of an extinct bear found by workmen on the farm of a Mr. Sommers, near Overpeck Station, on the C. H. & D. R. R., four miles from Hamilton, Butler County, Ohio. In regard to the discovery of the specimen, Mr. Roberts writes: "The man who found it was digging a well. When twenty-three feet from the surface he found the skull lying on what appeared to be a nest of petrified sticks." Attempts to secure some of these 'petrified sticks' have thus far failed.

The skull, that of a very aged individual, probably a female, represents a species somewhat smaller than a black bear. It lacks the lower jaw; but is otherwise only slightly imperfect. Part of the left zygomatic arch is missing, and the left occipital condyle is broken away. These injuries are of ancient date. The posterior region of the palate was crushed in by the shovel or pick that dislodged the skull from the gravel in which it was imbedded. At the same time the occiput was severely cracked and the right zygomatic arch broken. The pieces, however, fit together accurately. Six teeth remain in place—the canines, the posterior premolars, and the posterior molars. All traces of tubercles had been worn from the crowns of the grinding teeth before the animal's death.

The skull differs from that of any living American bear in its long, low rostrum, deeply concave forehead, small braincase,

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and large cheekteeth. The extinct North American species hitherto described are *Arctodus pristinus* Leidy, *Ursus amplidens* Leidy, *U. americanus fossilis* Leidy, *Arctotherium simum* Cope, and *Ursus haplodon* Cope. These may be examined chronologically.

*Arctodus pristinus* Leidy (Proc. Acad. Nat. Sci. Philadelphia, VII, p. 90, June, 1854), from the sands of the Ashley River, South Carolina, is a small-toothed species in no way closely related to that represented by the Ohio specimen.

*Ursus amplidens* Leidy (Journ. Acad. Nat. Sci. Philadelphia, N. S., III, p. 168, November, 1856), from "a ravine in the vicinity of Natchez, Mississippi," is known from a penultimate upper molar, and a left mandibular ramus with the posterior tooth in place. The specimen is thus exactly complementary to the Ohio skull. The only common ground for comparison between the two is the size of the molar figured by Leidy and the space formerly occupied by the homologous tooth in the Ohio specimen. Although the two correspond in a general way, this fact alone is obviously insufficient to establish specific identity.

*Ursus americanus fossilis* Leidy (Journ. Acad. Nat. Sci. Philadelphia, N. S., III, p. 169, November, 1856), discovered in the same ravine that contained the remains of *Ursus amplidens*, is a small-toothed bear closely related to the existing black bears, though probably distinct from any recent species.

*Arctotherium simum* Cope (American Naturalist, XIII, p. 791, December, 1879; *ibid.*, XXV, p. 997, November, 1891), from Shasta County, California, is readily distinguishable from the Ohio specimen by its generic characters and exceedingly short rostrum.

*Ursus haplodon* Cope (Proc. Acad. Nat. Sci. Philadelphia, 1896, p. 383), from Port Kennedy, Pennsylvania, is a very large animal, the jaws of which "exceed the average dimensions of the grizzly bear." Through the kindness of Mr. Witmer Stone I have been enabled to examine some of the material on which this species was based. This shows that the skull of *Ursus haplodon* was even more massive than that of the grizzly bears, and therefore nearly double the weight of the Ohio specimen, with which, therefore, the species requires no special comparison.

The animal represented by the Ohio specimen, as none of the names based on fossil North American bears are applicable to it, may be called :

***Ursus procerus* sp. nov.**

Type No. 4214, United States National Museum.

*General characters.*—Skull about as long as that of the black bears (e. g., *Ursus americanus* and *U. floridanus*), but much more slender. Braincase smaller and rostrum larger than in the black bears. Forehead deeply concave. Canine teeth as in *Ursus americanus*, but molars fully as large as those of *Ursus arctos* and the grizzly bears.

*Skull.*—Viewed from above, the skull of *Ursus procerus* differs from that of *U. americanus* and *U. floridanus* principally in the position of the postorbital processes relatively to the total length of the skull. In the black bears the distance from the tip of the nasals to a line joining the tips of the postorbital processes is contained nearly or quite twice in that from the latter point toinion. In *U. procerus* it is contained barely one and one-half times. Postorbital processes short and blunt. Antinion broader and longer than in *U. americanus*, strongly concave anteriorly, very little elevated laterally and posteriorly. The horizontally expanded basal region of the zygoma is about as broad as in *U. americanus*, but the shelving portion of the squamosal behind the zygoma is much narrower and more concave. The zygomatic arch as a whole stands out more widely from the side of the skull than in *U. americanus*. In this respect it suggests the grizzly bears.

Viewed from the side, the striking peculiarities of the skull become fully apparent. The rostrum is so long, and its dorsal outline so nearly parallel with the alveoli, that, combined with the general length and shallowness of the braincase, it gives the skull a strongly canine aspect. Distance from posterior border of infraorbital foramen to front of premaxilla nearly one and one half times depth of rostrum through infraorbital foramen. In *Ursus americanus* and *U. floridanus* the same distance scarcely exceeds the depth. The zygomatic arch as a whole does not differ noticeably from that of *U. americanus*, though its anterior base appears to be somewhat more lightly built. Braincase long and low. Occipital condyle larger than in the black bears (fully as large as in *U. horribilis*) and standing out much more conspicuously behind the paroccipital process. Sagittal crest and lambdoid crest well developed, but not unusually large. Inion strongly overhanging.

Viewed from beneath, the most striking peculiarities of the skull of *Ursus procerus* are the length and breadth of the palate and the narrowness of the occipital region. The palate is nearly as long and fully as broad as in the skull of a grizzly bear the basal length of which is 40 mm. greater than that of *U. procerus*. The hinder part of the palate is so much injured that its exact form cannot be determined; but so far as the fragments may be taken as a guide the posterior palatal region did not differ appreciably from the corresponding part of the black bear's skull. Interpterygoid fossa wider than in *Ursus americanus*. Distance from median line of basioccipital to outer side of mastoid process 12 mm. less than in the type skull of *Ursus floridanus* with approximately equal basal length. Audital bullae smaller than in *U. americanus* and *U. floridanus*, but not different in form. Glenoid fossa as in *U. americanus*.

The occiput, viewed from behind, is narrower and lower than in the black bears. This increases the apparent size of the zygomatic arches.

*Teeth.*—The teeth are so worn that all trace of their tuberculation is lost. In form they do not appear to differ noticeably from those of *U. americanus*. In size, however, the molars and premolars fully equal those of *Ursus horribilis*, though the canines are no larger than in a specimen of *U. americanus*, and considerably smaller than in the skull of *U. floridanus* to which reference has already been made.

*Measurements.*—The following measurements were taken with dividers. They therefore in no case follow the outline of the bone.

Greatest length 317. Basal length 290. Basilar length (estimated) 273.

Tip of nasals to line joining tips of postorbital processes 110.

Inion to line joining tips of postorbital processes 173.

Zygomatic breadth 176. Mastoid breadth 124.

Breadth across postorbital processes 97.

Breadth of rostrum across bases of canines 68.

Least breadth of rostrum 63. Lachrymal breadth 75.

Greatest breadth of braincase above roots of zygomata 92.

Fronto palatal depth (opposite anterior base of first molar) 53.

Occipital depth between audital bullæ 80.

Breadth of palate between posterior ends of last molars 45.

Breadth of palate at (and including) anterior ends of last molars 79.

Least breadth of palate between second premolars 45.

Length of palate from gnathion to plain of posterior edges of last molars 130. Greatest width of interpterygoid fossa 32.

Length of glenoid fossa 48. Length of occipital condyle 36.

Breadth of occipital condyle 16.6. Length of audital bulla 40.6.

Canine at edge of alveolus 20 x 13. Diastema 21.

Distance from anterior edge of large premolar to posterior edge of last molar (crowns) 73. The same (alveoli) 72.

Crown of large premolar 16 x 13. Alveolus of anterior molar 21.8 x 15.4.

Space between crowns of large premolar and posterior molar 23.

Crown of last molar 36 x 18.8.

*Remarks.*—*Ursus procerus* represents a type of bear, quite different from those found among living members of the genus, characterized by elongation and depression of the rostrum accompanied by reduction in the braincase. While the rostrum is lengthened and broadened to dimensions equal to those of the corresponding parts in the grizzly bears, its depth is even less than in the black bears, which the animal as a whole probably resembled in size. Though the canines are small, the molar teeth are probably relatively larger than in any other known bear. This disproportion in the sizes of the canines and molars may be partly sexual, if I am right in supposing that the type skull is that of a female. The characters of the skull and teeth are all opposed to those of the species of *Arctotherium*. With the other extinct American bears no close comparison can be made. *Ursus procerus* is not nearly related to the living black bears or grizzly bears. Of neither of these can it be regarded as a directly ancestral type.



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A NEW MOOSE FROM ALASKA.\*

BY GERRIT S. MILLER, JR.

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The Moose of Alaska has long been known to be the largest of American deer, but hitherto it has not been directly compared with true *Alces americanus*. During the summer of 1898 Mr. Dall De Weese, of Cañon City, Colorado, spent three months on the Kenai Peninsula, Alaska, in quest of large mammals for the United States National Museum. Of the Moose, the special object of his search, he secured four males and two females. These specimens show that the Alaskan Moose differs considerably from the animal inhabiting the eastern United States and eastern and central Canada. To the latter the specific names *americanus*,† *lobatus*,‡ and *muswa*§ have been applied. I can find no name, however, based on the Alaskan animal, which may be called:

*Alces gigas* sp. nov.

*Type* adult ♂ (skin and skull), No. 86166, United States National Museum, collected on the north side of Tustumena Lake, Kenai Peninsula, Alaska, in September, 1898, by Dall De Weese. Original number 16.

*General characters*.—A larger, more richly colored animal than the eastern moose. Skull with occipital portion narrower, palate broader, and mandible much heavier than in *Alces americanus*.

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† *Alces americanus* Jardine, Naturalists' Library, XXI (Mammalia—Deer, Antelopes, Camels, &c.), p. 125, 1835. Eastern North America.

‡ *Cervus lobatus* Agassiz, Proc. Boston Soc. Nat. Hist., II, p. 188, 1846. Eastern North America.

§ *Alces muswa* Richardson, Zool. Voyage of H. M. S. 'Herald,' Vertebrals, p. 102, 1852. Central Canada.

*Color*.—General color a grizzle of black and woodbrown darkening along spine and changing abruptly to clear black on chest, buttocks, and lower part of sides. Median line of belly hairbrown. Legs hair-brown or broccoli-brown with darker shading. Head like back, but more finely grizzled. Ears yellowish white internally, broccoli-brown externally.

*Skull and teeth*.—The skull of *Alces gigas* differs from that of *A. americanus* in its larger size and greater massiveness, as well as in certain details of form. Chief among the latter is the great breadth of the palate, relatively to the length of the toothrow. In three males of *A. gigas* the ratio of least palatal breadth (between anterior premolars) to length of toothrow is respectively 47.1, 47.1, and 44.7. In three males of *A. americanus* it is only 36, 36, and 39. In this respect *Alces gigas* resembles *Alces alces*, though the Alaskan animal shows no approach to the conspicuous deepening of the antorbital portion of the skull, or the peculiar form of the premaxillary characteristic of the European species. The occiput is relatively higher and narrower than in *A. americanus*. In two males of the latter the ratio of depth betweeninion and lower lip of foramen magnum to greatest width across paroccipital processes is 68.5 and 72.2, while in three of *A. gigas* it is 81.8, 84.8, and 87.5.

*Measurements*.—Of the following tables of measurements the first is based on data furnished by Mr. De Weese. The skull of *Alces americanus*, measurements of which are given in the second, is that of a very large individual from Maine, considerably older than any of the specimens of *A. gigas*.

*External Measurements of Alces gigas.*

Number and sex. ....	86162 ♀	86163 ♀	86164 ♂	86165 ♂	86166 ♂
Tip of nose to base of tail.....	2550	2562	2946	2946	3048
Tail vertebrae. . . . .	76.2	88.9	101	101	101
Ear from crown . . . . .	255.7	297	304	304	304
Height at shoulder . . . . .	1955	1930	2032	2032	2034
Shoulder to hip. . . . .	1574	1651	1701	1727	1752
Depth of body at shoulder. . .	812	851	914	927	965
Circumference of body at center	2032	2082	2184	2235	2286
Tip of nose to angle of mouth...	152.4	177.8	177.8	179	177.8

Cranial Measurements of *Alces gigas* and *A. americanus*.

Number and sex . . . . .	<i>Alces gigas</i> .				<i>A. americanus</i> , 14646 ♂
	86163 ♀	86164 ♂	86165 ♂	86166 ♂	
Greatest length . . . . .	615	635	645	633	600
Basal length . . . . .	570	570	596	570	560
Basilar length . . . . .	556	550	574	550	535
Tip of premaxilla to tip of nasal . . . . .	275	280	290	285	268
Median palatal length . . . . .	355	380	390	380	360
Tip of premaxilla to alveolus of first tooth . . . . .	230	240	236	230	225
Greatest breadth including orbits . . . . .	218	234	245	245	221
Least breadth including orbits . . . . .	168	190	200	206	180
Least width between antlers . . . . .	.....	190	170	180	165
Least width of frontals between orbits and antlers . . . . .	.....	205	210	225	195
Greatest antorbital breadth . . . . .	133	168	168	172	127
Zygomatic breadth . . . . .	203	218	223	228	203
Mastoid breadth . . . . .	147	165	172	168	170
Greatest width of palate including toothrows . . . . .	143	142	150	156	142
Least width of palate including toothrows . . . . .	105	110	118	110	98
Greatest width of palate between toothrows . . . . .	90	92	95	101	88
Least width of palate between toothrows . . . . .	68	69	67	70	53
Upper toothrow (crowns) . . . . .	147	143	150	154	147
Distance between tips of paroccipital processes . . . . .	85	92	100	95	80
Greatest width across paroccipital processes . . . . .	.....	165	160	165	175
Distance frominion to lower lip of foramen magnum . . . . .	.....	135	140	140	120
Depth between antlers . . . . .	122	146	155	143	132
Greatest expanse of antlers . . . . .	.....	1530	1600	1580	1330
Expanse between uppermost points . . . . .	.....	1200	1140	1120	760
Width of palmation . . . . .	.....	310	360	360	380
Least diameter between burr and first tine . . . . .	.....	175	210	200	172
Length of mandible . . . . .	470	.....	485	480	460
Depth of mandible at posterior end of toothrow . . . . .	59	62	58	65	59
Greatest depth of mandible . . . . .	223	230	235	223	225
Least depth of mandible . . . . .	30	31	31	34	27
Diastema . . . . .	180	180	182	183	170
Mandibular toothrow (crowns) . . . . .	158	152	160	165	160



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FERNS OF THE DISMAL SWAMP, VIRGINIA.

BY WILLIAM PALMER.

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The ferns of the Dismal Swamp may be divided into three distinct groups according to their place of growth: (1) arboreal species, (2) true swamp species, and (3) ground species. The first group may be divided into two subdivisions: (*a*) those growing on fallen mossy trunks, about the bases of living gum trees, on dead cypress knees, bent gum roots, and on decaying stumps; (*b*) those growing exclusively on trunks and branches of living trees. The first subdivision (*a*) comprises the following species: *Dryopteris marginalis*, *D. spinulosa*, *D. goldicana celsa*, *Polystichum acrostichoides*, *Asplenium platyneuron*, *Struthopteris regulis*, *S. cinnamomea*, *Botrychium obliquum*. The second subdivision (*b*) contains but one species, *Polypodium polypodioides*, which grows exclusively on the trunks and larger branches of living trees, usually high up in the tops, and probably on all the species of deciduous trees. The true swamp ferns include but two species, *Woodwardia virginica* and *W. areolata*, which grow on the peaty remains of former vegetable life, always in wet places and often, especially the former, in water.

The ground ferns occur, not in the true peaty swamp, but in the surrounding low sandy area, which nevertheless constitutes a very large portion of the Dismal Swamp. These are *Dryopteris noveboracensis*, *D. thelypteris*, *Asplenium filixfemina*, *Pteris aquilina*, *Onoclea sensibilis*, *Struthopteris regulis*, *S. cinnamomea*. But one fern ally (*Selaginella apus*) has been found.

A study of many forms of the life of this vast swamp reveals the interesting fact of the occurrence in abundance of many

southern and northern types. It is a meeting ground where many Austroriparian forms reach their northern limit, while more northern forms either find their lowest or most southern habitat, or have variously changed representatives. The causes of this complex condition vary according to the requirements of the different species and the circumstances of their introduction into the area. In a general way it may be stated that species requiring abundance of sunlight and living above the undergrowth are southern, while those intimately associated with the surface of the swamp are of more northern, or of higher-ground derivation. But there are many exceptions. The swamp undoubtedly has been slowly evolved from a salt-water lagoon to its present condition; hence all its present life has been introduced from surrounding regions.

Of the ferns *Polypodium polypodioides* is distinctly Austroriparian, here reaching almost its northern limit.\* *Dryopteris goldiana celsa*, though related to an Alleghenian form, is quite distinct and is undoubtedly its representative. The woodwardias are coastal-swamp species, and though found well into New England do not occur at any great elevation. The two species of *Struthopteris* are most abundant at higher altitudes and owe their presence here to their swamp habits and the ability of the plantlets to find a congenial home. They do not fruit abundantly and doubtless before man interfered with the forest were rare. Seven other species, *Dryopteris marginalis*, *D. noveboracensis*, *D. thelypteris*, *Polystichum acrostichoides*, *Asplenium filixfemina*, *Pteris aquilina*, *Onclea sensibilis*, are all higher-ground species. With the exception of *D. marginalis* they are abundant in the general region bordering the swamp. *Botrychium obliquum* also belongs in the same category and may be common about the swamp. Two other species usually found on higher and dryer ground, *Dryopteris spinulosa* and *Asplenium platyneuron*, are not abundant in the swamp, and the former was noticed but once elsewhere. Both are somewhat changed from the typical form, though perhaps hardly sufficiently to warrant separation.

Thus the only species growing on living trees is truly Austroriparian; the next is *D. goldiana celsa*, which occupies a higher habitat in the swamp than any of the others except *D. spinulosa*, which occurs with it, though not so abundantly, and which

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\*I have taken it near Cape Charles City, Northampton Co., Va.

has also undergone some change on account of its unusual environment.

The flooded condition of the true peaty swamp floor for several months of the year prevents the growth of ground ferns, except the water-loving woodwardias; therefore all the species of the swamp proper which grow near the ground occur just above the high-water line and rarely more than three feet above it.

A systematic examination of the whole swamp for ferns has not been possible, but enough has been learned to show that a number of species have adapted themselves to very unusual conditions, and that some have undergone changes from the normal type. The main factor in determining the character of the pteridophytic life is the flooded condition of the swamp floor for several months annually, but this is less potent now than formerly.

#### LIST OF SPECIES.

##### 1. *Botrychium obliquum* Muhl. Oblique Grape Fern.

On June 10, 1899, I found four plants, growing with other species on logs, at the side of Washington ditch. They were sterile fronds of the previous year's growth. The fronds are less ample and the divisions shorter, more rounded and more widely placed than in any specimens from about Washington. The dried roots are stronger, blacker, and more abundant.

##### 2. *Struthopteris* \* *regalis* (Linn.) Bernh. Royal Fern.

*Osmunda regalis* Linn., Sp. Pl. p. 1065, 1753.

Abundant, usually in large clumps scattered throughout the swamp and always on dead stumps except in the sandy areas.

In many cases hundreds of dead persistent stipes testify to the great age of the clumps. Just above high-water mark mosses have established a foothold in a broad ring around the old knees of the cypresses, the bends of gum roots, and logs. Various plants, especially ferns, take root in this moss and often reach a large size. The oddity and beauty of such growths are striking, especially on a well-preserved knee where the reddish apex rises several inches above the surrounding moss. (See plate I, Fig. 7.)

\* The ferns usually placed in *Osmunda* evidently belong to Bernhardt's genus *Struthopteris* (not *Struthopteris* of authors). The essential features of Bernhardt's description are as follows: 21. *Struthopteris mihi*. *Sporangia subglobosa*, bivalvia. E. g. *Osmunda regalis*. L. — — *Cinnamomea*. L. — — *Claytoniana*. L. \* \* \*. Obs. 2. Caue ne *Struthopteridem* meam cum *Struthopteride* Hall, confundas. (Journ. für die Botanik, Band 2, 126, 1801.)

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When little sunlight reaches these plants fruiting spikes are rarely seen, and usually but one on a plant. Along the outlet canal, where the trees have been thinned and drainage is complete, the dryer and more sunny conditions have affected the fruiting and many variations showing partial fertility were collected.

**3. *Struthopteris cinnamomea* (Linn.) Bernh. Cinnamon Fern.**

*Osmunda cinnamomea* Linn., Sp. Pl., p. 1066, 1753.

Abundant, usually with the preceding species, but not so partial to the cypress knees and the shadier situations. Both species, but more especially *S. cinnamomea*, are evidently recent additions to the true swamp flora; far away from the ditches and bogie roads they are rarely seen. This species is usually very tall and luxuriant, but does not fruit as extensively as in more open and higher places. On June 9, 1893, I found two plants near the head of Washington ditch in an open place. They had all the pinnules much reduced in size and many of the lower basal ones were greatly elongated and often pinnatifid. The plants were exposed to generous sunlight for part of the day, but owing to their situation on a decaying log were necessarily limited in root moisture.

**4. *Onoclea sensibilis* Linn. Sensitive Fern.**

By no means common in the sandy area but found mainly in the streams and ditches bordering the swamp.

**5. *Polystichum acrostichoides* (Michx.) Schott. Christmas Fern.**

On June 3, 1896, several hundred yards from the eastern end of Lake Drummond, I found several dwarfed plants on a small well-decayed log. The largest frond, a fertile one, measured  $9\frac{1}{2}$  inches (235 mm.\*) and  $1\frac{1}{4}$  in. (44) wide, with a stipe  $4\frac{1}{4}$  (124) long. The longest pinna is  $\frac{5}{8}$  (21.5) long and  $\frac{1}{4}$  (5.5) wide. The largest sterile frond was shorter and barely wider. The edges of the pinnae were regular but very finely spinulose. No others were found, but the species is common in the ravines near Suffolk, about fourteen miles distant.

**6. *Dryopteris noveboracensis* (Linn.) A. Gray. New York Fern.**

Where the sandy areas of the swamp blend with the true peaty swamp, and especially in the old bogie roads in these dryer portions of the swamp, this species is abundant.

**7. *Dryopteris thelypteris* (Linn.) A. Gray. Marsh Fern.**

Found at but one place, above the head of Washington ditch. Its long spindling fronds were growing in the bushes on the bank, but the normal plant was not seen.

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\*All measurements in parentheses are in millimeters.



**8. *Dryopteris goldieana celsa* subsp. nov. Log Fern.**

(Pl. I, Figs. 1-6, 8-12.)

Structurally similar to *Dryopteris goldieana goldieana* (Pl. I, Figs. 13, 14), but differing in its very erect habit, longer and narrower fronds with smaller and more widely separated pinnules and pinnae, and with the apex regularly decreasing instead of crowded and suddenly shortened. Upper basal pinnules of lower pinnae either absent or very much and usually unequally reduced. Fronds lanceolate or lanceolate oblong. Stipes at base densely covered with large and richly alutaceous scales with brown centers and transparent, sharply defined margins; upper scales paler and almost unicolor. Type No. 340,398 National Herbarium, Dismal Swamp, Norfolk County, Virginia, June 8, 1899, William Palmer (collector's No. 247). Measurement of type, frond  $22\frac{1}{2}$  inches (523); longest pinna, the 5th,  $5\frac{3}{4}$  (136.5); stipe 12 (305). Fertile pinnae less than  $1\frac{1}{4}$  (31.5) wide; sterile basal pair, greatest width  $1\frac{1}{4}$  (44.5).

Measurements of twenty paratypes: Fronds 10-24 inches (254-609), average 19 (483). Stipes: 7-14 $\frac{1}{2}$  (178-368.5), average 10 $\frac{1}{2}$  (267). Largest frond 24 (609.5); stipe 10 $\frac{1}{2}$  (261); longest pinna, the 8th,  $4\frac{1}{2}$  (124); the lowest pinna 4 (101.5). Sterile fronds few, much smaller and less elongate. Three lower pairs of pinnae of fertile fronds sterile or nearly so.

In habit, situation, and aspect this fern is quite unlike typical *D. goldieana*. It suggests *D. floridana*\* but differs in outline; its pinnules are not so widely separated, and the shape of the lower pinnae, especially the two lowest, are quite different, as shown in Figs. 6 and 9-12.

Its relationship to *goldieana* is shown by the character of the scales at the base of the stipe (quite unlike the *cristata* group), by the reduced size of the basal pinnules on the lower pinnae, the lower one being absent, by the broadest portion of the lower pinnae not occurring at the base, and by the peculiar stalked character of the rachides of the pinnae, especially the basal pair. Though occurring in a swamp it is practically a plant of dry habitat, as compared with the broad herbaceous *D. goldieana*, which grows on damp ground. The difference is well shown by comparing the tall and narrow *D. cristata*, characteristic of dryer ground, with the large, coarse *D. cristata clintoniana*, which grows in wetter places. This apparent paradox is rendered plain by the statement that *celsa* does not grow on the ground of the swamp but in moss on stumps and logs where the supply of moisture is limited and where the plants are exposed to a fair, often abundant amount of light. *D. goldieana* grows in damp, rich and well shaded situations. Both these plants are densely covered about the bases of the stipes with large dark brown centered scales, almost black in *goldieana*, most of which are bordered by a narrow, transparent ribbon, the contrast between the two portions being sharply defined.

In *celsa* the rachis is grooved in front even to the apex, but in *goldieana*

\**Dryopteris floridana* bears the same relation to *D. cristata*, or rather to *D. c. clintoniana*, that *D. g. celsa* does to *D. goldieana*.

it is stouter, more fleshy and grooved for only a short distance above the lower pinna, or faintly further.

In *D. cristata*, *floridana* and in *clintoniana* the basal pinnules of all the pinnae are largest and longest; in *celsa* and *goldieana*, some pinnae, especially the apical ones, are similar, but the lower pinnae, especially the lowermost, have the pinnules, even for several pairs, very much reduced. In good fertile fronds of *celsa* and *goldieana* the lower basal pinnule of the lowest pair of pinnae is always absent but sometimes present or apparently present in some undersized fronds. This is often the case in *goldieana*, but only occurs rarely in *celsa*. The basal pinnules of the upper pinnae of both these ferns are always opposite and very exactly so, but they begin to diverge at the centers of the pinnae. On the lower pinnae this pining is rare and it is not easy to determine whether the opposite of the reduced upper basal pinnule has never been developed or whether it is represented by the one occupying the adjoining position. This latter view would seem to be correct, the lower pinnules having been gradually moved along the rachis toward the tip during the evolution of the form. In very young fronds (Figs. 5, 8) there is a wide space of the lower pinna beneath, the pinnule seems forced away from the rachis and the base of the midvein inclines toward the rachis of the pinna for some distance. The same result is shown in numerous young fronds of both forms. Fig. 14 represents the common type of *goldieana*, while Figs. 6 and 9-12 are from specimens of *celsa*.

*Dryopteris goldieana* is extremely herbaceous and robust, its pinnules and pinnae being large and often overlapping. In *celsa* they are always widely separated; both are much narrower, and there is no sudden change from the long, wide pinnae to the shorter, narrower one of a crowded apex as in *goldieana*. The reduction or absence of the lower pinnules results in producing a stalk for the pinnae, short in *goldieana*, longer in *celsa*. The pinnae of *celsa* incline upwards very decidedly, whereas in *goldieana* they stand at a right angle to the rachis or are only slightly inclined upwards. These differences between the very erect narrow *celsa* and the broad, drooping and herbaceous *goldieana* result from differences in habitat, the dryer and lighter situation of *celsa* contrasting in its results with the gloomy, damp habitat of *goldieana*.

On July 30, 1899, I found two clumps of *goldieana* on the Virginia bluffs of the Potomac river opposite Cabin John Bridge. The first contained over fifty plants, all with well drooping fronds and nearly all the lower pinnules of the lower pinnae normal. These plants were growing at the foot of the talus among the rocks, and the trees formed a dense canopy overhead. In the second clump a mile further down, in a precisely similar situation, were several dozen plants. But here the thinness of the foliage overhead permitted the sun to shine on the plants for several hours daily. The early fronds were drooping as in the first clump, but the later and mostly fertile fronds were more erect, and the divisions were less herbaceous and consequently less crowded, but in no case to the same extent as in *celsa*.

The differences in the character of the lower basal pinnules in these two ferns is ecologically an interesting feature. The usual character of these pinnules in *goldieana* is shown in Fig. 14. In Fig. 13 is shown another, which was growing in bright sunlight, at Great Falls, Virginia; the shortening of the lower pinnules is evident. The first style of frond grows in damp well-shaded situations and droops in such a way that a practically equal amount of light is received by all portions of its upper surface. But a difference occurs when the light is more abundant; then the frond becomes strengthened, that is, more erect, and consequently the upper and middle portions shade the lower pinnae. A struggle thus ensues between the pinnae for light. The lowermost, owing to their position, are seriously handicapped, but instead of remaining in the same or nearly the same plane, as in the case of well-shaded fronds, these lower pinnae turn more toward the light, so that their tips approach each other and their upper surfaces are turned nearly 90 degrees, so as to obtain the light as nearly as possible perpendicular to their plane. In pressing such specimens the stalks of one or more pinnae are necessarily fractured where they join the stipe. In thus bringing the lower pinnae almost together in order to obtain the greatest amount of light the greater portion of each pinna is entirely successful, but at the expense of the lower pinnules; especially so on the lowest and less so toward the middle. These lower pinnules are shaded not only by their own overlapping when the pinnae are flexed, but also by the stout stipe and the pinnules above. Consequently they do not receive a normal amount of light and therefore during the growing period fail to develop perfectly, and are outstripped by the more fortunately placed middle pinnules. One extreme is shown in the usual frond of *goldieana*, the other in nearly every frond of *celsa*. Specimens of *goldieana* collected about Washington, an intermediate locality, altitudinally and geographically, have these basal pinnules in many cases much, and often unequally, reduced, but never to the extent of *celsa*. Similarity of general structure and the ecological character of the differences between these two ferns warrant the view that *celsa* is a true subspecies of *goldieana*, and therefore a geographical race or physiological subspecies. Our swamp plant therefore is a product of abundant light, limited root moisture, and the struggle for existence under peculiar conditions, which do not, or but very slightly, affect its relative.

In June, 1896, near the head of Washington ditch, I found a few immature plants of *celsa* and considered them *D. c. clintoniana*. The following year, at the same place, I found some larger but imperfect fertile fronds. This year, while penetrating the swamp north of the outlet canal and about eight miles east of the other locality, I found numerous plants ranging, through all stages, from those with the first fronds and the remains of the prothalli, to plants over thirty inches high. It is possible that this fern occurs in other localities in the same general region.

The log fern grows in several situations. About the base of a large gum tree, where there was an accumulation of waste woody matter and an

entanglement of various shrubs and other plants, it was abundant and of all sizes. An odd location, and the most common, was along the curved lower side of a fallen mossy trunk where the plants occupied a line just above high-water mark. Usually such a log was exposed to a large amount of light and its upper surface was destitute of mosses and other plants. On other logs usually situated in a tangle and well shaded, the ferns grew in a line along the middle of the top, either with several plants of *D. spinulosa*, a few flowering plants, or more generally alone. In every instance the rhizome was imbedded in the moss and the plants were but loosely attached to the wood; a pull on a frond was generally sufficient to bring up the whole plant.

#### 9. *Dryopteris marginalis* (Linn.) A. Gray. Marginal Fern.

A most unexpected surprise was the discovery on June 10, 1899, of a single dwarfed plant of this rock-haunting fern. Four miles westward from Lake Drummond up Washington ditch, is a recently made plank road which runs a mile or more into the swamp. Some distance along this road a large tree had fallen years before, and on its broken and decaying stump I found the plant with five fronds, three of which were fertile. The largest measures  $8\frac{3}{4}$  inches (219.5), and the stipe  $5\frac{1}{2}$  (142.5). The sori are not abundant and are confined to the apex. There are 279 on the best fruiting frond.

#### 10. *Dryopteris spinulosa* (Retz) Kuntze. Spinulose Fern.

A few large plants were growing on logs with *D. g. celsa* and several immature plants were found near the head of Washington ditch on logs and stumps. They differ from specimens taken about Washington, D. C., in having all the divisions narrower and more widely separated and the apex lengthened. The color is a darker green. The pinnules are more inclined toward the rachis, and the pinnae trend upward to a greater extent. Some specimens, both large and small, show a more triangular outline, with longer lower pinnae, and this is evidently the tendency in plants growing in deep shade. In June, 1896, the mouth of a well near Suffolk had many plants growing between the bricks. All were herbaceous and dwarfed, and the single fertile one found had very small sori near the margin.

#### 11. *Woodwardia virginica* (Linn.) J. E. Smith. Virginia Chain-fern.

Extremely abundant. Its natural habitat is in the pools which occur between the elevations made by the enlarged bases of the trees, and in the cane swamps; but wherever the swamp has been burnt out this fern occurs in greater luxuriance. Along the ten miles of Jericho ditch which has been dug from Lake Drummond through the northern part of the swamp, it is very abundant and large, and grows in the water in dense beds usually for many yards. The fronds are here quite erect and face the sun — i. e., the plane of the frond is at a right angle to the line of aver-

age duration of direct sunlight received by the frond; so that the plants on the east side of the ditch face toward the southwest, while those on the west side approximate the southeast, often to the east, according to the amount of foliage about them. The largest frond collected measures 2 feet 10½ inches (970), its jet black stipe is 2 feet 9½ inches long (955) and greatly enlarged at the base. At the outlet canal at the east end of Lake Drummond, where the depth of the canal has drained the adjoining swamp, it is abundant but harsh and less herbaceous, and was found fruiting abundantly in early June. Plantlets were common.

**12. *Woodwardia areolata* (Linn.) Moore. Narrow Chain-fern.**

Abundant and growing with its relative except in dryer situations. It is common in low places in the swamp, among the cane and other vegetation and about the bases of the trees. Its delicate fronds grow best where well protected from the sun either by taller vegetation or in wet, densely crowded or well-shaded situations. Prothallium fronds and young plants are numerous on small decaying logs which are well shaded and constantly wet.

**13. *Asplenium platyneuron* (Linn.) Oakes. Ebony Spleenwort.**

Near the western end of Washington ditch a dozen or so plants of various sizes were found growing on well-shaded stumps near the water and mixed with numerous other plants. The fronds are all much broader and longer than specimens of similar age from higher and dryer altitudes, and are more deeply and irregularly incised. The pinnae are wider apart, broader, more blunt, and the basal portion overlaps the rachis. The largest frond measures 18½ inches long (476), the longest pinna is 1½ inches (41.5), and the stipe is 3¼ inches (88).

**14. *Asplenium filixfemina* (Linn.) Bernh. Lady-fern.**

Common throughout the sandy woods but not seen in the peaty swamp. A green-stemmed form was the only one found.

**15. *Pteris aquilina* Linn. Bracken.**

Seen but sparingly near the upper end of Jericho ditch, where the dredging has formed an embankment.

**16. *Polypodium polypodioides* (Linn.) Hitchcock. Gray Polypody.**

Extremely abundant but usually high up in the tree tops. It persists for several years on the fallen trees but finally succumbs. It is abundant on the cypresses standing in Lake Drummond, where its usually dry curled fronds may be reached from a boat. In the woods it is rarely found where it can be easily reached. In the streets of Suffolk it is abundant in wide bands on the trunks of the shade trees, usually growing in dense masses, mostly on the northern sides and about ten feet from the pavement.

EXPLANATION OF PLATE I.

FIGS. 1, 2, 3. *Dryopteris goldieana celsa*. First prothallium fronds, enlarged about twice.

FIG. 4. Second frond of same, natural size.

FIG. 5. Third frond of same, slightly enlarged.

FIG. 8. Fourth frond of same, reduced one-third.

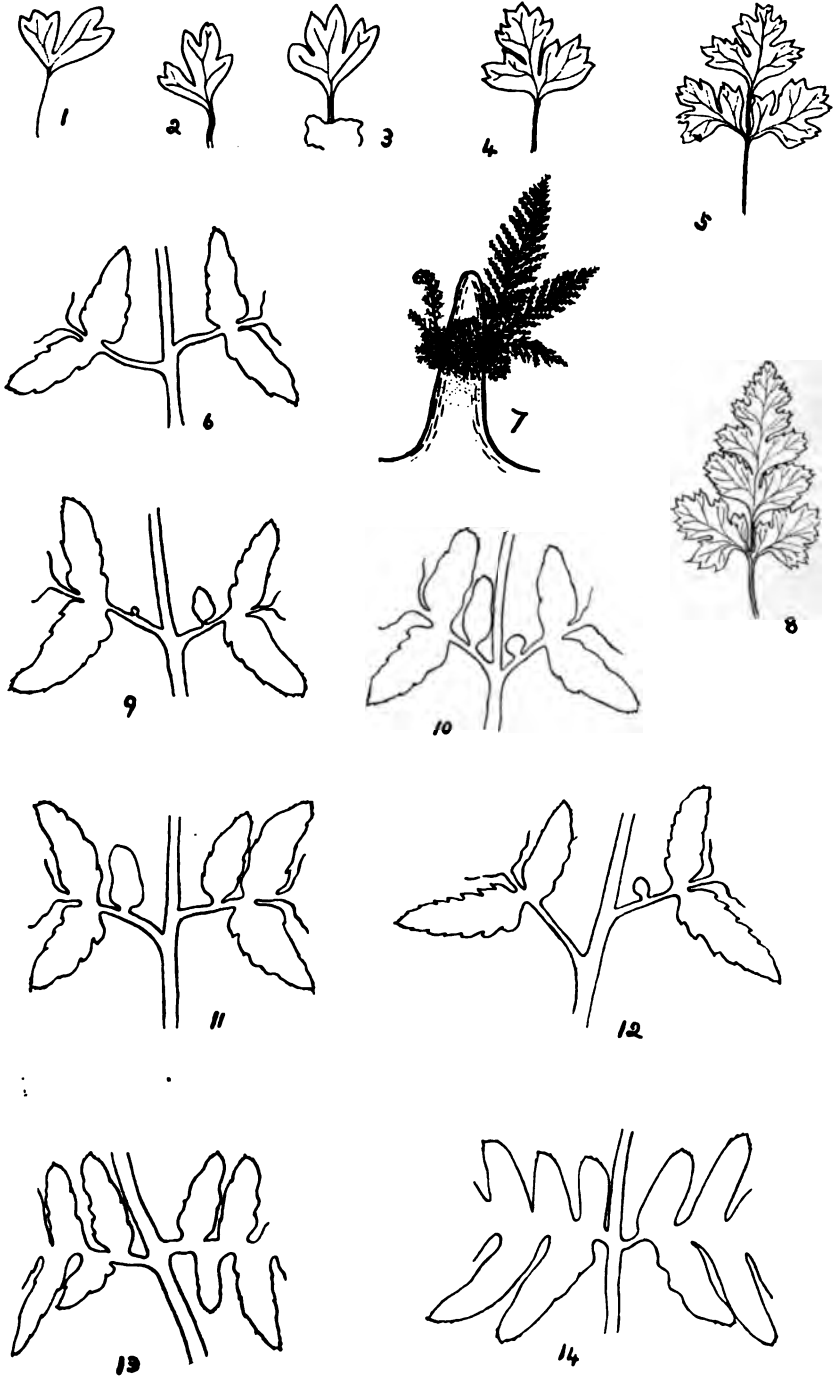
FIGS. 6, 9, 10, 11, 12. Lower basal pinnules of same, reduced one-third.

FIG. 13. *Dryopteris goldieana goldieana*. Lower basal pinnules, from poorly shaded frond, reduced one-third.

FIG. 14. The same, from an ordinary frond.

FIG. 7. Plants growing in moss on a dead cypress knee above high-water mark.

FIGS. 1-5 were drawn from the fronds; FIGS. 6 and 8-14 from tracings of photographs, the fronds being used as negatives.



FIGS. 1-6, 8-12. *DRYOPTERIS GOLDIEANA CELSA*

FIGS. 13, 14. *DRYOPTERIS GOLDIEANA GOLDIEANA*





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NOTES ON *TATOUA* AND OTHER GENERA OF  
EDENTATES.

BY T. S. PALMER.

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Some months ago Mr. Gerrit S. Miller, Jr., published a paper entitled 'Notes on the Naked-tailed Armadillos,\* in which he showed that three generic names had been proposed for the group: *Xenurus* by Wagler in 1830, *Tatoua* by Gray in 1865, and *Lysiurus* by Ameghino in 1891. These names were all based on *Dasypus unicinctus* Linnæus, and *Xenurus* being preoccupied in ornithology, *Tatoua* was adopted as the proper designation of the genus.

Since the appearance of this paper I have made a list of the genera of Edentates which has brought to light two additional names based on *Dasypus unicinctus*, both earlier than *Tatoua* Gray. These names are *Arizostus*, proposed by Gloger † in 1841, and *Cubassous*, published by McMurtrie ‡ in 1831, only one year after Wagler's *Xenurus*. *Cubassous* (which is credited to Cuvier) is merely a Latinized form of a French term used by Cuvier and Buffon, and taken from a native name. McMurtrie frequently adopted such names in his translation of Cuvier's 'Règne Animal' and not only transformed them into Latin, but accompanied them by generic diagnoses and brief descriptions of the species. His reasons for adopting this course are explained as follows: "The absurdity of translating into English the technical portion, or the nomenclature, was too apparent to demand a moment's

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\* See *antea*, pp. 1-2.

† Hand-u. Hilfsbuch d. Naturgeschichte, p. 114, 1841.

‡ Cuvier's Animal Kingdom, Am. ed., I, p. 164, 1831.

consideration—the genius of our language forbids it. To have left these terms in French would have been inexpedient for self-evident reasons; and the idea of giving a class in Latin, an order in French, &c., presented too revolting a medley. By giving them all in Latin, the common language of science, these objections vanished.” (p. iv.)

*Cabassous*, instead of *Tatoua*, is therefore the earliest tenable name for the naked-tailed armadillos, and the species given by Trouessart, including the one added by Miller, will stand: *Cabassous unicinctus* (Linn.), *C. loricatus* (Natt.), *C. hispidus* (Burm.), *C. (Ziphila) lugubris* (Gray), and *C. (Ziphila) centralis* (Miller).

Other French names used by Cuvier for armadillos, which McMurtrie endeavored to preserve by putting them in Latin form, are: *Apara*, based on *Dasyppustricinctus*; *Cachicamus*, including *D. novemcinctus* and *D. septemcinctus*; and *Encoubertus*, including *D. sexcinctus* and *D. octodecimcinctus*. These names, however, are untenable, as they were only common names prior to 1831, and other generic terms had previously come into use for the groups to which they were applied. Thus *Apara* is antedated by *Tolypeutes* Illiger, 1811, *Cachicamus* by *Tatu* Blumenbach, 1803, while *Encoubertus* is a synonym of *Euphractus* Wagler, 1830, and *Dasyppus* Linnaeus, 1758.

Thomas\* has already called attention to the fact that *Cyclopes* Gray, 1821, is the earliest tenable name for the two-toed anteater (*Myrmecophaga didactyla* Linn.), usually referred to *Cyclothurus*. But as he merely mentioned it in a discussion of the names in Gloger's 'Handbuch,' it has been apparently overlooked, and it may therefore be worth while to refer to it in this connection, as *Cyclothurus* still remains in use. As a matter of fact, *Cyclothurus*, although usually quoted as dating from 1825,† is merely a *nomen nudum* in this reference, and was first published as a valid genus in 1842, in Lesson's 'Nouveau Tableau Règne Animal,' p. 152. There are at least three other genera based on *Myrmecophaga didactyla*: *Eurypterna* Gloger, 1841, *Myrmydon* ‡ Wagler, 1830, and *Didactyles* § F. Cuvier, 1829, which are actually earlier than *Cyclothurus*, so that the latter name is clearly untenable and should give way to *Cyclopes*.

\* Ann. & Mag. Nat. Hist., 6th ser., XV, p. 191, Feb., 1895.

† Thomson's Annals of Philos., XXVI, p. 343, Nov., 1825.

‡ Nat. Syst. d. Amphibien, p. 36, 1830.

§ Dict. Sci. Nat., LIX, p. 501, 1829.

*Tamandua*, like *Cyclothurus*, is usually quoted from Thomson's *Annals of Philosophy* (l. c., p. 343). It was, however, merely published in a list of genera as '*Tamandua*, Gray, M. R.,' and the only pretense to a description consists of the letters 'M. R.,' referring to Gray's paper in the London Medical Repository.\* This paper contains the following list of edentates:

"Tamanoir, *Myrmecophaga*. Lin. *M. jubata*. Lin.

*Tamandua*, *Myrmecophaga tamandua*. Cuv.

Ant-eater, *Cyclopes*, G. *Myrmecophaga didactyla*. Lin.

Pargolen [sic], *Manis*. *Manis pentadactyla*. Lin."

Here *Tamandua* is merely a common name and stands on an entirely different footing from *Cyclopes*. A careful examination of this paper will show (1) that the names in the first column of this list are intended as common names, those in the second as genera, and these are followed by the type or included species; (2) that when the common name is adopted for the genus, it is usually repeated; and (3) that genera are usually (but not always) followed by the authority, *e. g.*, *Myrmecophaga* Lin. and *Cyclopes* G. Thus Tamanoir, *Tamandua*, Ant-eater, and Pangolin are common names, while *Myrmecophaga*, *Cyclopes*, and *Manis* are genera. The first unquestionable use of *Tamandua* as a genus is in Lesson's '*Nouveau Tableau*,' p. 152, 1842, where it is based on *Myrmecophaga tetradactyla* Linn. But as in the case of *Cyclothurus* it is antedated, since *Dryoryx* Gloger, 1841. and *Uroleptes*† Wagler, 1830, were also based on *M. tetradactyla* (of which *M. tamandua* is a synonym). *Uroleptes* has priority over *Dryoryx*, and is apparently the earliest tenable name for the genus.

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\* Vol. XV, p. 305, Apr. 1, 1821.

† Nat. System d. Amphibien, p. 36, 1830.



PROCEEDINGS  
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A NEW TREEFROG FROM THE DISTRICT OF  
COLUMBIA.\*

BY GERRIT S. MILLER, JR.

In June, 1893, Mr. W. P. Hay added to the known fauna of the District of Columbia † a treefrog which he found in considerable numbers in a marsh at Mount Vernon, Virginia. He presented eighteen specimens of the animal, identified as *Hyla cinerea* (Daudin) (= *H. 'carolinensis'*), to the United States National Museum. Two years later Mr. Hay collected specimens at Little Hunting Creek, Va. Four of these are now in the National Museum. This frog was first brought to my notice early in June, 1898, when, in company with Mr. A. H. Howell, I heard its notes, strikingly different from those of the other batrachians of the region, at Four Mile Run, Va. A week later seven were captured here by Mr. Howell and Mr. E. A. Preble. Since then we have taken, in the marshes at Four Mile Run and Dyke, a locality between Alexandria and Mount Vernon, Virginia, about thirty individuals, some of which I have had in captivity for over a year. Comparison of these with living examples of *Hyla cinerea* from Bay St. Louis, Miss., shows that the northern and southern forms are readily distinguishable from each other by characters of both form and color. Most conspicuous among these is the normal absence in the northern animal of the stripes on sides

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† The 'fauna of the District of Columbia' is generally understood to include that of the region within a radius of twenty miles from the Capitol.

and legs so conspicuous in *Hyla cinerea*. It may therefore be called :

***Hyla evittata* sp. nov.**

*Type* adult ♂ (in alcohol) No. 26,291, United States National Museum, collected at Four Mile Run, Alexandria County, Virginia, July 15, 1898, by Gerrit S. Miller, Jr., and Edward A. Preble.

*Zonal position.*—This frog is probably confined to the Upper Austral zone.

*Geographic distribution.*—While the animal is at present known from the marshes of the Potomac River near Washington only, it is to be looked for near the coast from Chesapeake Bay to Long Island Sound.

*General characters.*—Like *Hyla cinerea* (Daudin) but with broader, deeper muzzle and normally unstriped body and legs.

*Color.*—Entire dorsal surface varying from olivaceous brown through deep myrtle-green to pale yellowish grass-green; ventral surface white, irregularly tinged with yellow, especially on chin and throat; colors of back and belly fading rather abruptly into each other on lower part of sides; skin of under surface of limbs unpigmented, transparent; legs and jaws slightly paler on sides than above; eye very bright and iridescent, the pupil black, the iris golden greenish yellow, thickly dotted with black; back with a few—usually less than half a dozen—inconspicuous, minute, yellowish dots.

*Measurements.*—Type: \* head and body, 48; hind leg, 69; femur, 20; tibia, 21; tarsus, 11; hind foot, 17; humerus, 8; forearm, 8; front foot, 10; greatest width of head, 14; eye to nostril, 3.5; distance between nostrils, 3.5. An adult ♂ from the type locality: head and body, 50; hind leg, 70; femur, 21; tibia, 21; tarsus, 11; hind foot, 17; humerus, 8; forearm, 8; front foot, 10; greatest width of head, 14; eye to nostril, 4; distance between nostrils, 3.

*Remarks.*—*Hyla evittata* is at once distinguishable from *H. cinerea*, its only near ally, by the absence of the stripes on sides and legs, so conspicuous in the latter. Except for the differences in the shape of the head, the two animals agree perfectly in form and dimensions. *Hyla evittata*, however, probably averages slightly larger than *H. cinerea*. The peculiarities in the form of the head are more readily seen than described. In *Hyla evittata* the outline of the muzzle when viewed from above is distinctly more bluntly rounded than in *H. cinerea*, and as a result the nostrils are wider apart and less distant both from eyes and tip of muzzle. Viewed from the side, the depth from nostril to mouth is perceptibly greater in *H. evittata* than in *H. cinerea*. The granulation of the skin of belly and hind legs is identical in the two animals. These comparisons are entirely based on living individuals.

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\*An adult ♂ *H. cinerea* from Bay St. Louis, Miss., measures: head and body, 48; hind leg, 68; femur, 20; tibia, 21; tarsus, 11; hind foot, 15; humerus, 9; forearm, 9; front foot, 10; greatest width of head, 13; eye to nostril, 4; distance between nostrils, 2.5.

Color variation in *Hyla exillata* is very great, and as in other treefrogs chiefly dependent on the character of the surface on which the animal is resting. When searching for food among the leaves and stems of pickerel weed and pond-lilies, *Hyla exillata* assumes a yellowish grass-green tint, closely harmonizing with the color of the plants. In captivity the color is usually darker and duller, this tendency culminating in rich myrtle-green and dark olivaceous brown in individuals that have rested on brown bark or have remained long hidden in a dark corner. The color during hibernation under moss and sod is much paler than that assumed by the same individuals when hiding in similar places during the summer. However great the changes in color may be, at no time is there developed any trace of stripes. If rudiments of these are present they are always visible. Similarly in *Hyla cinerea*, which undergoes an exactly parallel series of color changes, the stripes are never affected in distinctness, though they are most conspicuous when the general color of the animal offers the greatest contrast. The stripes of *Hyla cinerea* vary in living individuals from silvery white to metallic reddish gold. The body stripes are almost invariably bordered by a narrow black line. When the animal is in repose the body stripes are about 1.5 mm. in width, but when it is uttering its note the body becomes greatly swollen and the stripes broaden to three times their normal width, and at the same time assume their brightest colors. The leg stripes are narrower and less sharply defined than the body stripes, and their dark margins are less constant in development.

As to the constancy of the color differences between the two forms: I have handled about two dozen living and freshly killed specimens of *Hyla exillata*, and have probably seen nearly as many more at a distance of only a few feet. Among these one had a faintly developed stripe at the angle of the jaw. Of the twenty-two alcoholic specimens collected by Mr. Hay and now in the National Museum, eight have traces of the body stripe, which, however, in no instance is margined with black, or as sharply defined as in those southern specimens in which the stripe is shortened and narrowed. Of sixty-one specimens of *Hyla cinerea* (seven received alive from H. H. & C. S. Brimley,\* the others preserved in alcohol in the U. S. National Museum †) there is considerable variation in the leg stripes, but with only two exceptions the body stripe, though varying in length and breadth, is conspicuously developed, definite in outline, and usually margined with black. In the two abnormal individuals (one from Bay St. Louis, Miss., the other from New Orleans, La.) the leg stripes are absent, and the body stripes reduced to mere traces near the angle of the jaw. When forwarding the unstriped specimen from Mississippi, the Messrs. Brimley wrote that it was the only one of the kind observed among the large number that have passed through

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\* Taken at Bay St. Louis, Miss.

† From the following localities: Texas, New Braunfels; Louisiana, New Orleans; Florida, Clear Water, Georgiana, Indian River, Lemon City, Marco Island, Pensacola; North Carolina, Beaufort.

their hands. Such individuals as these are readily distinguishable from the faintly striped specimens of *Hyla exillata* by the form of the muzzle.

*Habits.*—Very little is known about the habits of *Hyla exillata*. In June and July the animals are to be found in the rank vegetation of the tide marshes. Here they remain quiet during the day, but as evening approaches they become active and noisy. Their food at this time consists chiefly of a small beetle that is found on the leaves of the pond-lilies. The note is like that of *Hyla pickeringii* in form, but in quality it is comparatively harsh and reedy, with a suggestion of distant Guinea-fowl chatter, and scarcely a trace of the peculiar freshness so characteristic of the song of the smaller species. The song period continues through June and July. Later in the season the frogs leave the low marsh vegetation. As they are then perfectly silent they are difficult to find, though occasionally one may be seen in a bush or small tree, but never far from water.



PROCEEDINGS  
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## THE DOGBANES OF THE DISTRICT OF COLUMBIA.\*

BY GERRIT S. MILLER, JR.

Two dogbanes, *Apocynum cannabinum* and *A. androsaemifolium*, were recorded in the first detailed list of plants of the District of Columbia, published nearly seventy years ago.† In 1876 the same plants were included in the 'Flora Columbiana' of the Potomac-Side Naturalists' Club, without special comment.‡ Five years later Ward relegated the second species to the list of plants whose occurrence in the vicinity of Washington is doubtful.§ At the same time|| he recognized two forms of *Apocynum cannabinum*, the typical *A. cannabinum cannabinum*, of general distribution, and *A. cannabinum glaberrimum*, found only on the flats of the Potomac River bottom at Little Falls. In 1886 Knowlton discovered a species which he recorded as *Apocynum androsaemifolium*,¶ and in 1892\*\* and 1896†† Holm published further records of a plant that he supposed to be the same. In 1897 Greene raised the *Apocynum cannabinum glaberrimum* of Ward to specific rank under the name *A. album*, and at the same time described Holm's *A.*

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† *Floræ Columbianæ Prodrromus*, p. 24, 1830.

‡ *Flora Columbiana*, p. 16, 1876.

§ *Guide to the Flora of Washington and Vicinity* (Bull. U. S. Nat. Mus. No. 22), p. 12, 1881.

|| *Ibid.*, p. 97.

¶ *Proc. Biol. Soc., Washington*, III, p. 108.

\*\* *Ibid.*, VII, p. 118.

†† *Ibid.*, X, p. 36.

*androsæmifolium* as a new species, *A. medium*.\* Thus *Apocynum androsæmifolium* was again eliminated from the District flora, unless Knowlton's plant should prove to have been correctly identified. His specimens, however, cannot now be found. Up to the present time, therefore, three species have been positively recorded from the vicinity of the District of Columbia:† *Apocynum cannabinum* Linneus, *A. album* Greene, and *A. medium* Greene. But this number must be more than doubled, as I find from an examination of about two thousand plants that *Apocynum androsæmifolium* is actually a member of the flora, while in addition there occur three hitherto undescribed species.

#### NOMENCLATURE.

Eight names have been based on dogbanes from eastern North America. They are as follows:

**Album.** *Apocynum album* Greene, Pittonia, III, p. 230, December, 1897, is based on the narrow-leaved, white-flowered plant of the *cannabinum* type common on the shores of the Potomac River near Washington, and throughout its range confined to similar situations. Dr. Greene informs me that the type was collected near Chain Bridge, Montgomery County, Maryland.

**Androsæmifolium.** [*Apocynum*] *androsæmifolium* Linneus, Species Plantarum, p. 213, 1753, is the spreading, large-flowered dogbane of the Boreal and Transition zones. Eastern Canada is probably the type locality of the species.

**Cannabinum.** [*Apocynum*] *cannabinum* Linneus, Species Plantarum, p. 213, 1753, is an erect, green-flowered plant of eastern North America. The original description leaves no doubt that the name was used by Linneus in essentially the same sense that it is understood today.

**Glaberrimum.** [*Apocynum cannabinum*] *a glaberrimum* De Candolle, Prodr. Syst. Nat. Regn. Veg., pt. VIII, p. 439, 1844. The description of this plant (under *Apocynum cannabinum*) is as follows: "*a glaberrimum*. A. Canadense maximum flore minimo herbaceo. Pluk. 35, t. 13 f. 1. (ic. mediocr.) *A. erectum*, etc., ejusd. t. 260. f. 4. *A. cannabinum* R. Br. wern. trans. I. p. 68. Torr. ! fl. un. st. p. 276. *A. cannabinum* α Hook. l. c. t. 139 opt. *A. piscatorium* Dougl. ! mss. ex nostr. specim. hic referendum; eandem vero plantam ad *A. hypericifolium* retulit cl. Hook. l. c. (v. s)." This name has recently been used by Britton and Brown for the plant described as *A. album* by Greene. The reason for this course is not clear, as none of the descriptions cited by De Candolle refer to the plant in question. Plukenet's figures, for a tracing of which I am

\* Pittonia, III, pp. 229-230, December, 1897.

† That is, within a radius of twenty miles from the Capitol.

indebted to Mr. Chas. Bullard, of Cambridge, Mass., both represent broad-leaved plants of the *cannabinum* type. R. Brown's description\* refers merely to a lanceolate-leaved, glabrous plant. It contains no reference to any of the peculiar characters of *Apocynum album*. The same is true of the accounts given by Torrey and Hooker. It seems obvious, therefore, that unless better evidence can be brought forward than that furnished by the original description, the name *glaberrimum* is too vaguely defined to supplant the well-established name *album*. At most it can perhaps be used for one of the numerous forms of *Apocynum cannabinum*.

**Hypericifolium.** *Apocynum hypericifolium* Aiton, Hortus Kewensis, I, p. 304, 1798, is a clasping-leaved green-flowered plant that has not yet been detected in the neighborhood of the District of Columbia. Although recorded from Virginia† the species is now known from the region west of the Alleghenies only.

**Incanum.** [*Apocynum androsæmifolium*] *β. incanum* De Candolle, Prodr. Syst. Nat. Regn. Veg., pt. VIII, p. 439, 1844, is merely an unusually pubescent individual of *Apocynum androsæmifolium*. Such plants not infrequently occur, but they do not represent a definite form.

**Medium.** *Apocynum medium* Greene, Pittonia, III, p. 229, December, 1897, is a small-flowered member of the *androsæmifolium* group. It was first recorded by Holm as *Apocynum androsæmifolium*.

**Pubescens.** *A[pocynum] pubescens* R. Brown, Mem. Wern. Nat. Hist. Soc., I, (1808-10), p. 68, 1811,‡ from Virginia, is a pubescent form of *A. cannabinum*, probably worthy of recognition by name. A plant agreeing closely with the original description is not uncommon in the District of Columbia; and the U. S. National Herbarium contains a specimen collected in Virginia. This is a whitish-flowered species probably distinct from the *A. pubescens* of Britton and Brown.§

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\* "*A. cannabinum*, foliis lanceolatis utrinque acutis, glabris, cymis paniculatis, calyce tubum corollæ æquante." This copy I owe to Mr. Chas. Bullard.

† De Candolle, Prodr. Syst. Nat. Regn. Veg., pt. VIII, p. 440, 1844.

‡ Professor N. L. Britton has kindly sent me a copy of the original description of *Apocynum pubescens*. It is as follows: "*A. pubescens*, foliis ovato-oblongis mucronatis; basi obtusis; utrinque cymaque brevioribus pubescentibus, calyce corollam subæquante.

"Hab. In Virginia, Mitchell, in Herb. Banks, [ubi V. S]."

§ Ill. Flora N. United States, Canada, and Brit. Poss., III, p. 3. 1898.

SYNOPSIS OF THE DOGBANES OF THE DISTRICT OF COLUMBIA.

Corolla conspicuous (white or pink), its lobes spreading or recurved.

Inflorescence both terminal and axillary; corolla terete, broadly campanulate, bright pink, about 8 mm. in length, its tube narrowed in the throat at level of tips of calyx lobes..... *A. ANDROSÆMIFOLIUM* (p. 82).

Inflorescence strictly terminal; corolla pentagonal, urceolate to campanulate or tubular, white or pale pink, 4-7 mm. in length, its tube not narrowed in the throat.

Branches mostly green, ascending; erect white flowers (about 7 mm. long) in large, compact, rather flat cymes; corolla campanulate..... *A. SPECIOSUM* (p. 83).

Branches mostly strongly tinged with reddish purple, those at least of the upper part of the plant widely spreading; suberect white or pale pink flowers (4-6 mm. long) in small, loose, irregular cymes; corolla tubular to urceolate.

Calyx lobes broad, much shorter than tube of pinkish, suburceolate or tubular corolla; flowers about 6 mm. in length..... *A. MEDIUM* (p. 84).

Calyx lobes narrow, about as long as tube of white, urceolate corolla; flowers about 5 mm. in length..... *A. URCEOLIFER* (p. 85).

Corolla inconspicuous (greenish or whitish), its lobes erect or nearly so.

Leaves few, spreading or drooping on slender petioles which are usually three times the length of the flowers..... *A. NEMORALE* (p. 87).

Leaves many, ascending on robust petioles which are usually scarcely longer than flowers.

Leaves glabrous, from one fifth to one-fourth as broad as long; flowers essentially white; plant very slender and much branched..... *A. ALBUM* (p. 88).

Leaves pubescent on underside at least, from one-third to one-half as broad as long; flowers varying from dull green to white; plant stout and relatively less branched..... *A. CANNABINUM* (page 86).

***Apocynum androsæmifolium* Linnæus.**

(Pl. II, Fig. 1.)

1753. [*Apocynum*] *androsæmifolium* Linnæus, Species Plantarum, p. 213.  
 1844. [*Apocynum androsæmifolium*] *β. incanum* De Candolle, Prodr. Syst. Nat. Veg., pt. VIII, p. 439.  
 1898. *Apocynum androsæmifolium* Britton and Brown, Illustrated Flora Northern United States, Canada, and Brit. Poss., III, p. 3.

*Type locality*.—Probably eastern Canada.

*Geographic distribution*.—Eastern North America from Newfoundland (specimen in U. S. Nat. Herb.) to Georgia (Britton and Brown), west to the plains.

*Zonal position*.—*Apocynum androsaemifolium* appears to be an inhabitant of the Transition zone and Lower Boreal zone, occasionally reaching the Upper Austral zone, but probably by accident.

*Habitat*.—Thickets and fields.

*Characters*.—*Plant* robust, 1 to 1.5 m. high, from a perennial horizontal rootstock; *branches* dichotomously widely spreading, glabrous, strongly tinged with purple; *leaves* spreading, mucronate tipped (about 55 x 40 mm.), the uppermost ovate oblong, the lower broadly rounded at base, the upper slightly narrowed; upperside of leaves glabrous, dusky green, underside of leaves pale, and finely but inconspicuously pubescent; *petioles* slender, mostly about 5 mm. in length, finely pubescent on underside; *inflorescence* in small, irregular, terminal and axillary cymes of few nodding flowers, the axillary clusters generally the smaller; cymes usually shorter than leaves; *pedicels* 5–10 mm. in length, subulate-bracted at base; *calyx* glabrous, its segments narrow, generally less than half as long as corolla tube; *corolla* bright pink, in fully developed flowers about 8 mm. long, widely campanulate, its tube terete, the throat narrowed at level of tip of calyx lobes; corolla segments rounded at tip, considerably more than half as long as tube, and when fully developed conspicuously recurved; *pods* drooping, about 170 mm. in length.

*Remarks*.—*Apocynum androsaemifolium* is immediately recognizable among the species occurring in eastern North America by its ovate leaves, and large, bright pink, nodding flowers in partly axillary clusters, and by the terete corolla tube, distinctly narrowed in the throat. The outline of the corolla varies much in different stages of growth. Some of the forms that it assumes in its development from the bud to the fully grown flower are shown in the figures (see Pl. II, Fig. 1). Throughout its growth, however, the corolla tube is strictly terete, while in all of the plants with which the species might be confused the pentagonal contour of the corolla is evident even in the half-grown buds. The characteristic form of the corolla is for the most part lost in dried specimens. On account of the dichotomous branching of the stem, there can be no distinct central flower cluster as in *A. cannabinum*.

The only specimens of this species positively known to have been collected in the vicinity of the District of Columbia are two plants which I found at the roadside between Sligo Branch and Paint Branch, Montgomery County, Maryland, on June 25, 1899.

***Apocynum speciosum* sp. nov.**

(Pl. II, Fig. 2.)

*Type* No. 340,395, United States National Herbarium, collected in dry old field, at side of road leading from Silver Spring to Sligo Branch, Montgomery County, Maryland, June 25, 1899, by Gerrit S. Miller, Jr.

*Geographic distribution.*—*Apocynum speciosum* is at present known from two localities, Sligo and Glen Echo, both in Montgomery County, Maryland.

*Zonal position.*—From its manner of occurrence this species appears to be a member of the Upper Austral flora.

*Habitat.*—Fields and roadsides.

*Characters.*—*Plant* robust, .75 to 1.25 m. high, from a perennial horizontal rootstock, *branches* ascending, glabrous, green; *leaves* ascending, oblong, inconspicuously mucronate tipped, the lower (mostly about 70-80 x 35-45) slightly rounded at base, the uppermost tapering at each end; upperside of leaves dark green, glabrous, underside slightly paler and essentially glabrous except along the veins where a fine pubescence may be detected; *petioles* 4-8 mm. in length, slender above, shorter and more robust below, finely pubescent on underside; *inflorescence* in large compact, flat-topped strictly terminal cymes of very many erect flowers, the cymes at first exceeded in length by the leaves, but afterwards slightly longer; *pedicels* about 4 mm. in length subulate-bracted at base; *calyx* very slightly pubescent (this character probably variable), its segments narrow, half as long as corolla tube; *corolla* white or very faintly tinged with pink inside, about 6-7 mm. in length, campanulate, its tube distinctly pentagonal, the throat not narrowed; corolla segments pointed, slightly more than half as long as tube, spreading but not recurved; *pod*s drooping, about 70 to 120 mm. in length.

*Remarks.*—In this plant the habit is almost precisely similar to that of *A. cannabinum*. The branches are erect, very indistinctly, if at all, dichotomous, the leaves ascending, the flowers upright, and the inflorescence is in distinctly flat-topped cymes, the central of which, at the end of the main stem, is usually but not always the largest, and earliest to flower. As the lateral branches rise toward or above the level of the central head they in turn produce flat, terminal clusters, thus prolonging the flowering season from before the middle of June nearly to the middle of August. Accompanying the luxuriant inflorescence of this plant is an unusually profuse development of fruit, which often hangs in dense clusters from the lower part of a cyme which above is still a mass of flowers.

#### ***Apocynum medium* Greene.**

(Pl. II, Fig. 3.)

1892. *Apocynum androsatifolium* Holm, Proc. Biol. Soc. Washington, VII, p. 118 (not of Linnaeus 1753).

1897. *Apocynum medium* Greene, Pittonia, III, p. 229, December, 1897.

*Type locality.*—Vacant lots bordering 12th St., in Brookland, D. C.

*Zonal position.*—*Apocynum medium* will probably be found to occur throughout the upper Austral zone of the eastern United States. It is to be looked for also in the lower part of the Transition zone.

*Habitat.*—Dry, open ground.

*Characters.*—*Plant* slender, seldom more than 1 m. high, from a perennial horizontal rootstock; *branches* dichotomously widely spreading, gla-

brous, reddish purple; *leaves* spreading, oblong, mucronate-tipped, the lowermost (about 85 x 40) somewhat rounded at base, the uppermost tapering at each end; upperside of leaves dark, clear green, glabrous; underside yellowish green, finely pubescent; petioles about 5 mm. in length, slender above, more robust below, finely pubescent; *inflorescence* in small rather compact, strictly terminal but not flat-topped, cymes of numerous suberect flowers, the cymes usually exceeded by the leaves; *pedicels* 2-3 mm. in length, subulate bracted at base; *calyx* finely pubescent (this character probably inconstant), its segments broad, distinctly less than half as long as corolla tube; *corolla* light pink, or white strongly blotched with pink inside, about 5-6 mm. in length, suburceolate or tubular, its tube distinctly pentagonal, the throat not narrowed, corolla segments rounded, half as long as tube, spreading but not recurved; *Pods* drooping, about 90 mm. in length.

*Remarks.*—*Apocynum medium* has essentially the habit of *A. androsemfolium* though its peculiarities are slightly less pronounced. Together with *A. urceolifer* it is readily distinguished from *A. androsemfolium* by its differently shaped leaves, much smaller suberect flowers in strictly terminal racemes, and by the distinctly pentagonal corolla tube. The form of the corolla tube varies in perfectly developed flowers from faintly suburceolate to essentially short tubular, though the first is the more usual. The calyx segments are very short, conspicuously less than half as long as corolla tube. In drying, the corolla shrinks more than the calyx, so that in herbarium specimens the latter appears relatively longer than it actually is. I have examined one hundred or more living plants of this species growing in vacant lots on 12th St., Brookland, D. C., where Dr. Greene informs me his original specimens were collected.

***Apocynum urceolifer* sp. nov.**

(Pl. II, Fig. 4.)

*Type* No. 340,396, United States National Herbarium, collected on open, dry hillside at Capitol View Park, Montgomery County, Maryland, July 2, 1899, by Gerrit S. Miller, Jr.

*Geographic distribution.*—This species has been collected at the type locality and at Brightwood, D. C.

*Zonal position.*—*Apocynum urceolifer* is probably a member of the Upper Austral flora.

*Habitat.*—Fields and roadsides.

*Characters.*—*Plant* slender, usually less than 1 m. high, from a perennial horizontal rootstock; *branches* dichotomously widely spreading, glabrous, strongly tinged with reddish purple; *leaves* spreading, oblong, mucronate-tipped, the lowermost (about 90 x 40) rounded or subcordate at base, the uppermost tapering at each end, but more abruptly at base; upperside of leaves, clear green, glabrous; underside yellowish green, finely pubescent; petioles 2-4 mm. in length, finely pubescent on lower side; *inflorescence* in small, rather compact, but not flat-topped, strictly terminal cymes of numerous suberect flowers, the cymes at first exceeded by the leaves,

finally slightly longer; pedicels 3-5 mm. in length, subulate-bracted at base; calyx glabrous or pubescent, its segments very narrow, generally as long as corolla tube; corolla white or just perceptibly tinged with pink; about 4-5 mm. in length, urceolate, its tube conspicuously pentagonal, the throat not narrowed, corolla segments pointed, slightly more than half as long as tube, spreading but not recurved; *podæ* drooping, about 90 mm. in length.

*Remarks.*—Although at first sight *Apocynum urceolifer* rather closely resembles *A. medium*, the two plants are readily distinguishable. In habit they are essentially the same, but *A. urceolifer* is smaller and its stems are usually less strongly tinged with reddish purple, though in all probability neither character is constant. Its flowers are smaller than those of *A. medium*, and generally pure white, though sometimes faintly tinged with pink. The corolla is more conspicuously pentagonal, and very noticeably contracted at base of segments. The corolla segments are relatively longer and narrower than in *A. medium*, and distinctly pointed instead of rounded or obscurely pointed at tips. The calyx lobes are generally as long as the corolla tube, and frequently longer, sometimes a little spreading at tips, while in *A. medium* they are less than half as long as corolla tube and always closely appressed.

I have seen this plant growing at the type locality only. It is there common on the southeast slope of the hill directly north of the quarry. Mr. W. R. Maxon has collected it at the side of the Military Road, between Brightwood, D. C., and Rock Creek.

#### ***Apocynum cannabinum* Linnæus.**

(Pl. II, Figs. 6-7.)

1753. [*Apocynum*] *cannabinum* Linnæus, Sp. Plant., p. 213.

1811. *A[pocynum] pubescens* R. Brown, Mem. Wern. Nat. Hist. Soc., I, p. 68 (Virginia).

1844. [*Apocynum cannabinum*] *a glaberrimum* De Candolle, Prodr. Syst. Nat. Reg. Veg., pt. VIII, p. 434 (eastern North America).

1881. *Apocynum cannabinum* Ward, Guide to Flora of Washington and Vicinity (Bull. 22, U. S. Nat. Mus.), p. 97.

1898. *Apocynum cannabinum* Britton and Brown, Ill. Flora N. United States, Canada, and Brit. Poss., III, p. 3.

*Type locality.*—Probably eastern Canada.

*Geographic distribution.*—Eastern United States and southeastern Canada. Western limits of range not known.

*Zonal position.*—Transition and Austral zones.

*Habitat.*—Fields, thickets, and open woods.

*Characters.*—Plant robust, 1 to 1.75 m. high, from a perennial, horizontal, widely spreading rootstock; branches ascending, glabrous to densely velvety pubescent, green to reddish purple; leaves ascending, mucronate tipped, usually oblong and slightly more rounded at base than at tip, but often, especially the uppermost, tapering equally at each end, and lowermost frequently slightly cordate; dimensions when full grown about 120 x 55; upper side of leaves green, varying much in shade, generally glabrous but occasionally velvety pubescent; underside paler and usually



tinged with yellow, often densely pubescent, and seldom if ever without trace of pubescence, at least on the veins; *petioles* 3-7 mm. in length, slender above, shorter and robust below, pubescent or glabrous on underside; *inflorescence* in strictly terminal cymes, the larger of which are distinctly flat topped, the central cyme always developing first, and generally the largest; cymes composed of very many erect flowers and generally exceeded by the leaves; *pedicels* 1-4 mm. in length, subulate-bracted at base, glabrous or pubescent; *calyx* glabrous or pubescent, its segments very variable in form, but usually about equal to corolla tube in length, or slightly shorter, the tips appressed or widely spreading; *corolla* varying in color from white to dull green, and in length from 3 mm. to 4.5 mm., generally glabrous, but often pubescent, pentagonal, tubular or slightly campanulate; corolla segments equal to or shorter than tube, rounded or bluntly pointed at tips, erect or very slightly spreading, the margins usually slightly revolute; pods drooping, 130-200 mm. in length.

*Remarks.*—*Apocynum cannabinum* is a highly polymorphic species, much in need of critical study. It is readily distinguished, among the species known to occur in the eastern United States, by its robust, upright habit, large, short-petioled leaves, and small, green, greenish, whitish, or white flowers, with erect corolla lobes. Within these limits, however, variation is so great as to suggest the existence of numerous partly or perhaps completely segregated forms. Of those that occur in the District of Columbia, the most strongly marked is the *A. pubescens* of R. Brown. The whole plant (or the upper part at least) is densely velvety pubescent, and the upper leaves are unusually short, broad, and closely set. Flowers greenish or white. This is probably not the *A. pubescens* of Britton and Brown. Glabrate and narrow-leaved forms occur, and others of unusually slender habit; but I have seen none that bridge the gap between *A. cannabinum* and either of the following species.

#### ***Apocynum nemorale* sp. nov.**

*Type* No. 340,397, United States National Herbarium, collected at roadside in woods near end of Chain Bridge, Fairfax County, Virginia, July 14, 1899, by Wm. Palmer.

*Geographic distribution.*—This species is now known only from the type locality and the Virginia shore of the Potomac River at Great Falls.

*Zonal position.*—Probably confined to the Upper Austral and Transition zones.

*Habitat.*—Open woods.

*Characters.*—Like *Apocynum cannabinum* Linnæus, but with relatively few, spreading or drooping, leaves on slender petioles (usually 10-15 mm. in length) two or three times as long as flowers; corolla glabrous, greenish.

*Remarks.*—I should hesitate to separate this plant from *Apocynum cannabinum* were not its characters, trivial though they appear on paper, striking and constant in specimens, especially those living or freshly collected. Furthermore, while *A. cannabinum* occasionally occurs in open woods, together with *A. nemorale*, it never, so far as known, shows any tendency to assume the characters of the latter.

***Apocynum album* Greene.**

(Pl. II, Fig. 5.)

1881. *Apocynum cannabinum* var. *glaberrimum* Ward, Guide to Flora of Washington and Vicinity (Bull. 22, U. S. Nat. Mus.), p. 97 (not of De Candolle, 1844).  
 1897. *Apocynum album*. Greene, Pittonia, III, p. 230. December, 1897.  
 1898. *Apocynum cannabinum glaberrimum* Britton and Brown, III. Flora, N. United States, Canada and Brit. Poss., III, p. 3 (not of De Candolle, 1844).

*Type locality*.—Shore of Potomac River, near Chain Bridge, Montgomery County, Maryland.

*Geographic distribution*.—The range of *Apocynum album* is not well understood. Britton and Brown say, "range apparently nearly of the type, but more abundant northward." I have examined specimens from various points in Maryland along the shores of the Potomac River from Old Town to Marshall Hall, also from mouth of Tuckan Creek, Lancaster County, Pennsylvania; Stratford, Connecticut; and Ithaca, New York.

*Zonal position*.—Probably confined to the Upper Austral and Transition zones.

*Habitat*.—Beaches and river shores.

*Characters*.—Like *Apocynum cannabinum* Linnæus, but of more slender, branching habit, and with smaller, much narrower leaves and essentially white flowers. The largest leaves are about 110 mm. in length by 20–30 mm. in breadth, those of the upper part of the plant much smaller (about 60 x 15). They are oblong-lanceolate in form, those of the upper part of the plant acute at each end, those of lower part of plant rounded at base. All are mucronate tipped and wholly glabrous throughout. Petioles 2–3 mm. in length. Stems green, very slightly purple tinged, slender and much branched, the branching more profuse than in *A. cannabinum*, but of the same character. Inflorescence in terminal irregular cymes never as large as those commonly met with in *A. cannabinum*. Calyx lobes about as long as corolla tube or slightly shorter. Corolla about 4 mm. in length, white, often faintly tinged with green, pentagonal, short tubular or faintly campanulate, the upright lobes slightly more than half as long as tube, rounded at tips. Pods about 125 mm. in length. Rootstock horizontal, perennial, widely branching.

*Remarks*.—*Apocynum album* is so different from *A. cannabinum* as to require no very close comparison. The peculiar character of its habit, leaves, and inflorescence sharply differentiate it. The white or nearly white flowers, however, are not, taken alone, diagnostic, as forms of *A. cannabinum* frequently occur in which the corolla is equally white.

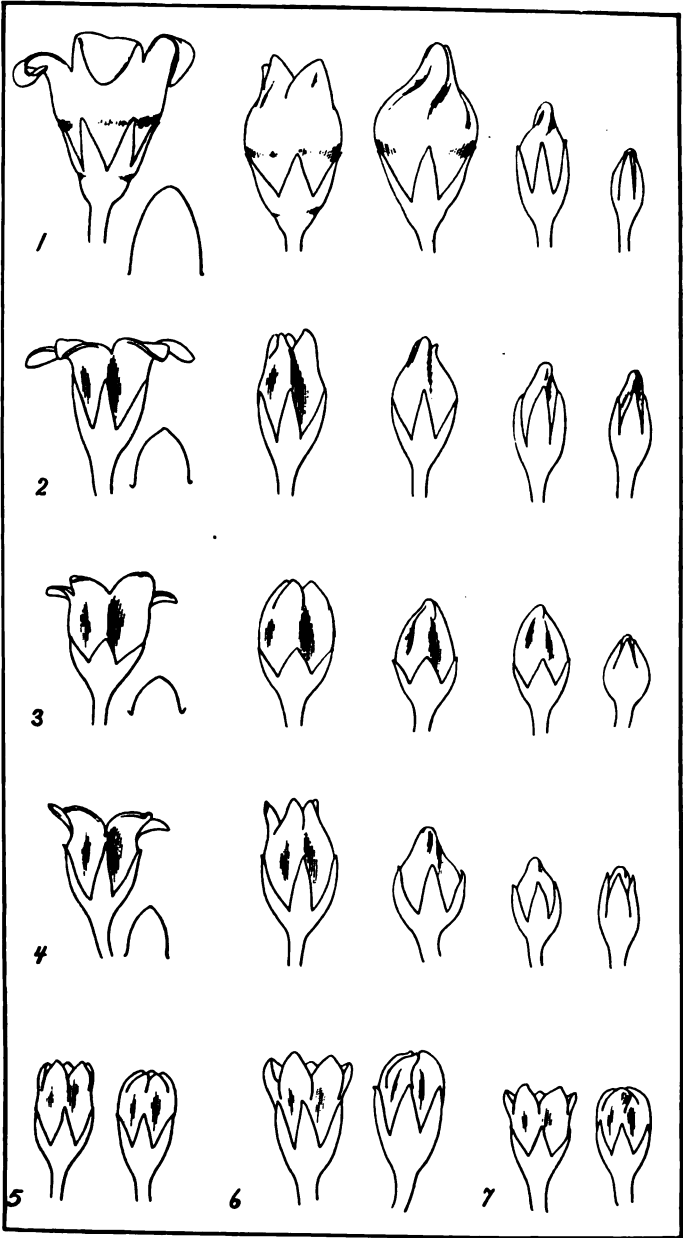
This plant appears to be strictly confined to beaches and river 'bottoms.' Near Washington it occupies, to the exclusion of other members of the genus, the flats and islands of the Potomac, seldom if ever growing on land that is not flooded at high water. Mr. E. A. Preble has sent me specimens from a small island in the Potomac at Oldtown, Maryland, and Mr. Wm. Palmer has collected it at Marshall Hall.



EXPLANATION OF PLATE II.

(All figures three times natural size )

- Fig. 1. *Apocynum androsaemifolium* Linnæus, from Maryland.
- Fig. 2. *Apocynum speciosum* Miller, topotype.
- Fig. 3. *Apocynum medium* Greene, topotype.
- Fig. 4. *Apocynum urceolifer* Miller, topotype.
- Fig. 5. *Apocynum album* Greene, topotype.
- Fig. 6. *Apocynum cannabinum* Linnæus, large-flowered form, from Kensington, Maryland.
- Fig. 7. *Apocynum cannabinum* Linnæus, small flowered form, from Capitol View Park, Maryland.



DOGBANES OF THE DISTRICT OF COLUMBIA



PROCEEDINGS  
OF THE  
BIOLOGICAL SOCIETY OF WASHINGTON

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ON SOME NEW OR RARE BIRDS FROM THE SIERRA  
NEVADA DE SANTA MARTA, COLOMBIA.

BY OUTRAM BANGS.

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From the latter part of January until early April, 1899, Mr. Wilmot W. Brown, Jr., collected, nearly continuously, in the Sierra Nevada de Santa Marta, Colombia, visiting many different stations at altitudes ranging from 3,000 to 15,000 feet. During this period he obtained more than 1,300 birds. The collection contains many species which he had not previously taken, some of which are new, besides series of many of the rarer species previously known only from a few specimens.

At a future date I intend, with Mr. Brown's help, to give a complete list, with field-notes, of all the birds he has collected in these mountains. In the present paper, the fourth on the birds of this region,\* I merely describe the new forms, record additional specimens of a few of the rarer species, and give those not previously taken by Mr. Brown.

Three gentlemen who have been extremely kind to Mr. Brown while in Colombia, and to whom I wish to express my thanks for the aid they have rendered him, are Theodoro V. Henriquez, U. S. consul at Rio Hacha; Pedro Christoffel, Indian inspector of the Sierra Nevada, and M. Carr, H. M. consul at Santa Marta. Again, I am under great obligations to Mr. Robert Ridgway and Dr. Chas. W. Richmond for allowing the use of the collection of birds in the National Museum, and in giving me valuable assistance in determining many species. I am also greatly indebted to my friend, Mr. Chas. F. Batchelder, for his kindness in allowing me to examine the Lafresnaye types in the collection of the Boston Society of Natural History, of which he is curator.

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\* See Proc. Biol. Soc. Wash., XII, pp. 131-144, 157-160, 171-182, 1898.

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(NOTE.—All measurements are in millimeters. Colors, when definite names are used, follow Ridgway's 'Nomenclature of Colors.')

***Actitis macularia* (Linn.).**

One adult female, La Concepcion, Mar. 23, 1899.

***Aramides axillaris* Lawr.**

One adult male, Chirua, Mar. 13, 1899.

***Gypagus papa* (Linn.).**

Three adults—a male from El Paramo de Macotama, 11,000 feet; one from Chirua; and a female from La Concepcion.

***Falco rufigularis* Daud.**

One adult male, from La Concepcion, Mar. 31, 1899.

***Amazona mercenaria* (Tech.).**

Two males, from Paramo de Chirua, 11,000 feet.

***Aulacorhamphus lautus* Bangs.**

Four adults, both sexes, from Chirua and La Concepcion. All agree closely with the type from San Miguel.

***Pharomachrus festatus* \* sp. nov.**

Three specimens from Chirua, one adult male, two adult females.

*Type*, from Chirua, Colombia; altitude, 7,000 feet. No. 6235, ♂ adult, coll. of E. A. and O. Bangs. Collected Mar. 20, 1899, by W. W. Brown, Jr.

*Specific characters*.—Intermediate in size, between *P. antisianus* and *P. auriceps*; bill intermediate in size, between the bills of these two species; adult ♂, with the three outermost rectrices white at ends (both outer and inner webs white, quills black), rest of tail black; adult ♀, with the three outermost rectrices white at ends, crossed lower down by black bars.

*Color*.—Adult ♂: Head, back, rump, breast, upper tail-coverts, and wing-coverts metallic green, in some lights bronzy, this tone more noticeable on head, throat, and upper tail-coverts; abdomen and under tail-coverts scarlet vermilion; primaries, secondaries, tertials and greater coverts black; flanks and sides black, the black feathers mostly concealed; tail black, the three outermost rectrices with grayish white ends, the quills black to their ends; white end on outer rectrix 50 mm. long, on next rectrix 59 mm. long, and on third 32 mm. long; 'bill yellow; iris hazel; † feet brownish black.

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\* *Festatus*, dressed in festal attire.

† Noted by Mr. Brown from fresh specimen.



Adult ♀, less brilliant than the ♂; throat and breast much mixed with drab brown; outer edges of primaries yellowish brown; tail black, the three outermost rectrices with deep white tips, the lower part of white tip crossed by two or three black bars; outermost rectrix with three white spots on outer web below lower cross-bar; second rectrix with one white spot on outer web below lower cross-bar; 'iris brown; '\* bill yellowish brown.

*Measurements*.—Type, adult ♂: Wing, 190; tail, 157; tarsus, 20; exposed culmen, 19.

Topotypes, adult ♀, No. 6236: Wing, 188; tail, 158.4; tarsus, 20; exposed culmen, 18.4.

Adult ♀, No. 6237: Wing, 189; tail, 158; tarsus, 19.6; exposed culmen, 18.4.

In the adult ♂ the longest upper tail-covert projects 48 mm. beyond the tail.

*Remarks*.—Had Mr. Brown taken but one specimen of this fine trogon I should have been inclined to regard it as a hybrid between *P. antisanus* and *P. auriceps*. Three examples, however, each one showing the characters equally well, disprove any such idea.

The type is a *fully adult* male, there is no trace of brownish on the outer edges of the primaries, the bill is wholly yellow, and the breast wholly metallic.

The difference in size and the peculiar tail, unlike that of either of the related species, distinguish this new trogon, which is probably confined to the Sierra Nevada de Santa Marta.

#### **Trogon personatus** Gould.

Eight specimens, both sexes, from Chirua, La Concepcion, and Macotama.

#### **Chloronerpes yucatanensis uropygialis** (Cab.).

Four specimens, both sexes, from La Concepcion and San Miguel. All agree exactly with Cabanis' description and with specimens in the U. S. National Museum from Costa Rica. This form, which ranges from Costa Rica southward, is distinguished from the more northern *C. yucatanensis* by the golden-brown back, the back of true *C. yucatanensis* being green.

#### **Pygmornis striigularis** Gould.

Two males from La Concepcion, altitude 3,000 feet.

#### **Leucuria phalerata** Bangs.

One adult male from Paramo de Macotama, 11,000 feet, Mar. 11, 1899. This specimen, in fine plumage, is just like the type, except that the bill is a little longer.

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\* Noted by Mr. Brown from fresh specimen.

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***Lafresnaya gayi* Bourc. and Muls.**

Four specimens, three males and one female, from Macotama, San Miguel, and Paramo de Chiriqua.

***Rhamphomicron dorsale* Salv. and Godm.**

Four specimens. An adult female and two adult males were taken at Paramo de Chiriqua, at the edge of the snow, on Mar. 25 and Feb. 25, 1899, at an altitude of 15,000 feet. A young male taken at La Concepcion, Feb. 16, 1899, at 3,000 feet, is much like the adult female, having a green back and spotted underparts; its tail, however, is like that of the adult male, except that the ends of the feathers are decidedly tipped with white.

***Anthocephala floriceps* (Gould).**

Nine specimens, from Pueblo Viejo (8,000 feet), Santa Cruz, La Concepcion, San Francisco, and Chirua. Four are adult males, two adult females, and three young males. The female has already been described by Messrs. Salvin and Godman. It differs from the male in lacking the crown patch, the top of the head being dull coppery green, much like the color of the rump. The tail is colored alike in both sexes; that of the female, however, has the central rectrices narrower. The whole tail is a little shorter and smaller than in the adult male. The young male is similar to the adult female.

Mr. Brown was especially on the lookout for the local species of hummers, none of which, except *Metallura districta* (described below) and *Panychlora russata*, seem to be easy to get. Before he started on his second trip he carefully studied the plates and descriptions of *Oxygogon cyanoleucus* and *Campylopterus phainopeplus*, so as to know the birds at once, but during nearly three months of active collecting he never saw a living example of either species.

***Metallura districta*\* sp. nov.**

Sixteen specimens from Pueblo Viejo (8,000 feet), La Concepcion, San Miguel, Paramo de Macotama, Macotama and Paramo de Chiriqua.

*Type*, from San Miguel, Colombia; altitude, 7,500 feet. No. 8223, ♀ adult, coll. of E. A. and O. Bangs. Collected Feb. 6, 1899, by W. W. Brown, Jr.

*Specific characters*.—Adult ♂ with much the general appearance of *M. smaragdincollis*, except that the rectrices are wider; the color of the tail is more auricular purple, less truly violet; under tail-coverts *buffy*; adult ♀ differing from ♀ of *M. smaragdincollis* in being paler on throat and breast, and of a more uniform color, and in being very much less spotted with green below.

*Color*.—Adult ♂: Upper surface dark, shining grass green; wings dark purplish brown; bend of wing rufous; under surface shining grass green,

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\* *Districtus*, busy, occupied.

somewhat varied by dusky, whitish, and buff edges and bases of some of the feathers, the buff showing most on breast and the dusky and whitish on center of abdomen; luminous throat patch glittering grass green; partially concealed woolly feathers on center of belly and flanks white; under tail-coverts ochraceous-buff with faint green central spots; tail, below, shining auricular purple; above, in some lights, auricular purple, in others, dark shining grass green. Adult ♀, above shining grass green; below, throat ochraceous-rufous, gradually becoming ochraceous-buff on chest and center of abdomen; sides spotted with shining grass green; under tail-coverts ochraceous-buff with dusky central spots; tail smaller than in the ♂, all the outer rectrices tipped with buff. Young ♂ similar to adult ♀, but with rather more green on sides; older ♂ similar to adult ♂, but lacking the luminous throat patch.

*Measurements*.—Adult ♂, No. 6232, from Paramo de Macotama: Wing, 60; tail, 44; culmen, 12.6; width of central rectrix, 10.8. Adult ♀ (type): Wing, 53; tail, 34.4; culmen, 12.4; width of central rectrix, 8.2.

*Remarks*.—Strangely enough *M. districta* bears a much stronger superficial resemblance to the far-away *M. smaragdinicollis*, as pointed out by Messrs. Salvin and Godman and by myself, than it does to its nearest neighbor, *M. tyrianthina*, of Venezuela and Colombia. The splendid series secured last winter by Mr. Brown proves, as might be expected, that the slight differences between the Sierra Nevada de Santa Marta bird and *M. smaragdinicollis* are perfectly constant.

#### *Ochthodiæta pernix* \* sp. nov.

*Type*, and only specimen, from Macotama, Colombia; altitude, 9,000 feet. No. 6004, ♂ adult, coll. of E. A. and O. Bangs. Collected Feb. 4, 1899, by W. W. Brown, Jr.

*Specific characters*.—Not like any other species in the genus.

*Color*.—Upper parts bistre, slightly darker on head and upper tail-coverts; wings dusky, wing-coverts and secondaries edged with ferruginous,† inner webs of secondaries ferruginous, except the dusky tip, lower half of inner webs of primaries ferruginous; tail dusky, outer web of outer rectrix ferruginous; throat white, streaked with olive; breast olive—each feather darkest at center, lighter at edges and often bordered with ferruginous, giving a streaked appearance; belly and crissum ferruginous; sides ferruginous, slightly shaded with olive; a blackish spot directly in front of eye, rest of lores whitish; lining of wing ferruginous; feet and bill black.

*Measurements*.—Type, adult ♂: Wing, 103; tail, 83; tarsus, 25.6; exposed culmen, 21.2.

*Remarks*.—*O. pernix* is wholly different from either *O. fumigatus* of Colombia or *O. lugubris* of Merida. Perhaps its nearest relative is *O. fusco*.

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\* *Pernix*, quick, active, nimble.

† The color called 'ferruginous' is not quite the ferruginous of Ridgway, but is rather duller. On the wings it inclines toward hazel and on the under parts it is a little blended with olive.

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*rufus* of Bolivia and southern Peru. It differs much, however, from that bird in its streaked throat and breast, as well as in other details of coloring. Although smaller, in a general way *O. pernix* suggests *Myiotheretes striaticollis*, which occurs in the same region with it. The two are, of course, very different in detail, but their superficial resemblance is quite striking.

*Ochthoeca poliogastra* Salv. and Godm.

Fourteen specimens, taken at all stations between 9,000 and 12,000 feet. On Mr. Brown's first trip he took only a single specimen of this local species.

*Platyrhynchus albogularis* Sel.

One female from La Concepcion, 3,000 feet, Jan. 29, 1899.

*Euscarthmus granadensis* Hartl.

One male from La Concepcion, Jan. 29, 1899.

*Hapalocercus paulus* \* sp. nov.

Ten specimens from Chirua, La Concepcion and San Miguel.

*Type* from Chirua, Colombia; altitude, 7,000 feet. No. 6115, ♀ adult, coll. of E. A. and O. Bangs. Collected Mar. 17, 1899, by W. W. Brown, Jr.

*Specific characters*.—Nearest *H. fulviceps* (Scl.) of Ecuador and Peru, but rufous crown patch narrower and shorter, not reaching eye nor bill; sides of head not distinctly rufus; also differing in details of coloration.

*Color*.—Above dull olive; wings dark hair-brown, with paler and more drab edges; greater and middle coverts tipped with isabella color (in some specimens cinnamon) forming two wing bars; inner webs of tertials and secondaries broadly edged with buff; tail hair brown with slight isabella color edges and tip; head subcrested, vertical feathers orange-rufous basally; sides of crown and forehead like back; lores, auriculars, and orbital ring dull cinnamon, very different in color from crest; throat, breast, and center of belly whitish, with an ill-defined and indistinct darker pectoral band; sides, flanks, and under tail-coverts straw-yellow, darkest and slightly tinged with olive on lower sides; lining of wing straw-yellow. Sexes similar.

*Measurements*.—Type, adult ♀: Wing, 45.6; tail, 37; tarsus, 19.6; exposed culmen, 10.

Adult ♂, No. 6117, from La Concepcion: Wing, 46; tail, 39; tarsus, 19.2; exposed culmen, 10.

*Remarks*.—*H. paulus* needs no comparison with the other Colombian species, *H. acutipennis*, which has acuminate primaries. Its relationship lies with *H. fulviceps* of western Ecuador and Peru.

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\* *Paulus*, small, little.

*Serpophaga cinerea grisea* (Lawr.).

Five specimens, from Chirua, San Miguel, and La Concepcion. These are just like skins in the U. S. National Museum from Costa Rica—true *grisea* of Lawrence—which seems to me to represent a perfectly good subspecies, differing considerably in color from true *S. cinerea* of Ecuador and Peru. Sclater, however, in the 'Catalogue of Birds in the British Museum' unites the two without a word.

*Myiopatis montensis* \* sp. nov.

Eighteen specimens from Paramo de Macotama, 11,000 feet; Macotama, 9,000 feet, and Paramo de Chiriqua, 12,000 feet.

Type from Paramo de Macotama, Colombia; altitude, 11,000 feet. No. 6112, ♂ adult, coll. of E. A. and O. Bangs. Collected Mar. 3, 1899, by W. W. Brown, Jr.

*Specific characters*.—Much larger than *M. semifusca* Scl., with much longer tail; bill longer and more slender, base of lower mandible black (yellowish in *semifusca*); tertials not so large nor so broadly rounded at ends; breast darker olive; pileum much darker than back. Sexes similar.

*Color*.—Pileum dark grayish olive; back and rump olive; lores, supra-orbital and supra-auricular streak, orbital ring, and most of auriculars grayish; a dusky post-ocular streak; wings dusky; wing coverts broadly tipped with dull tawny ochraceous, forming two broad wing bars; outer edges of secondaries tawny-ochraceous toward ends, wholly blackish at base, thus forming a blackish patch on closed wing just behind the second wing bar; edges and tips of tertials dull yellowish white (in some specimens, all in worn plumage with abraded feathers, the wing bars and edges of secondaries are all dull yellowish white); tail dusky, narrowly edged with olive and sometimes (in fresh plumage) tipped with isabella color; throat grayish white; breast grayish olive; belly and under tail-coverts primrose yellow; flanks olive; lining of wing and bend of wing pale yellowish; bill wholly blackish.

*Measurements*.—Type, adult ♂: Wing, 66.6; tail, 69; tarsus, 20.2; exposed culmen, 9.6. Adult ♀, No. 6104, from Macotama: Wing, 70; tail, 69; tarsus, 20.2; exposed culmen, 10. (These two examples exhibit the extremes in wing measurement in the series of eighteen specimens.)

*Remarks*.—When collecting in the lowlands and among the smaller mountains near Santa Marta, Mr. Brown took six examples of true *M. semifusca*. These are topotypes of the species. In the high mountains, from altitudes of 9,000 to 12,000 feet, he secured a series of eighteen specimens of a wholly different bird, which I have here called *M. montensis*. The differences between the two are so great as to seem almost more than specific; the very long tail, long slender, wholly black bill, and the differently shaped tertials of the mountain bird are very marked characters.

In ascending the mountains there seems to be a belt of from 6,000 to 9,000 feet where neither *M. semifusca* nor *M. montensis* is found. This

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\* *Montensis*, belonging to mountains.

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belt has been pretty thoroughly worked by Mr. Brown at many different points, and I feel sure he would have taken *Myiopatis* if it occurred there.

***Tyranniscus nigricapillus* (Lafr.).**

Two females, one from La Concepcion Mar. 11, 1899, the other from Chirua Feb. 13, 1899.

***Nuttallornis borealis* (Swains.).**

One female from La Concepcion Mar. 8, 1899.

***Pipreola aureipectus decora* \* subsp. nov.**

Two specimens, male and female, from Chirua.

*Type*, from Chirua, Colombia; altitude, 7,000 feet. No. 6173, ♂ adult, coll. of E. A. and O. Bangs. Collected Feb. 12. 1899, by W. W. Brown, Jr.

*Subspecific characters*.—Much smaller than true *P. aureipectus*, with much shorter tail. Similar in color and markings to true *P. aureipectus*, except that the ♂ has a broad band of yellow on each side, extending from the yellow throat across side of neck behind auriculars; in the ♀ this band shows as a row of yellow spots.

*Measurements*.—Type, adult ♂: Wing, 88; tail, 64; tarsus, 23; exposed culmen, 12. Adult ♀, topotype No. 6147: Wing, 84; tail 64; tarsus, 21.4; exposed culmen, 11.8.

*Remarks*.—I have examined Lafresnaye's types, consisting of three specimens, two males and one female, in splendid condition. They are, all three, much larger than the Chirua bird, their wing measurements being as follows: No. 2166,\* ♂ adult, 92; No. 2167,\* ♂ adult, 94; No. 2168,† ♀ adult, 92. The tail and tarsus also give larger measurements. In the two Lafresnaye males there are a few concealed yellow spots on the sides of the neck, where in the new form there is a broad yellow band. In the female there is no trace of yellow spots on the sides of the neck. Otherwise the colors and markings are about the same in *P. aureipectus decora* and in true *P. aureipectus*.

***Heliochera rubrocristata* (D'Orb. and Lafr.).**

Ten specimens, all from Paramo de Chiriqua and Paramo de Macotama, at altitudes ranging from 11,000 to 15,000 feet.

***Cinclodes fuscus albidiventris* (Scl.).**

Two males from Paramo de Chiriqua, 15,000 feet. These two specimens, without doubt, belong to the form called *albidiventris* by Sclater, which is a valid subspecies, quite different in color from the more south-

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\* Decorus, adorned, ornamented.

† Specimens in Lafresnaye collection in Boston Society of Natural History.

ern form—true *fuscus*. In the northern form the scaly markings come farther down on the breast and sides, and the belly is whitish, not buffy, as in true *fuscus*.

***Sclerurus albigularis propinquus* subsp. nov.**

*Type* (and only specimen secured on this trip \*), from Chirua, Colombia; altitude, 7,000; No. 6152, ♀ adult, coll. of E. A. and O. Bangs. Collected Feb. 7, 1899, by W. W. Brown, Jr.

*Subspecific characters*.—Somewhat intermediate between *S. canigularis* Ridgw., of Costa Rica, and true *S. albigularis* of Venezuela, most like the former but with pectoral band paler; throat lighter gray; upper parts duller brown, not chestnut. The new form is also the smallest of the three.

*Color*.—Back burnt umber with a slight olive cast, head rather more dusky; rump and upper tail-coverts bright chestnut; wings dark brown, primaries, tertials, and secondaries edged with burnt umber; primary coverts dusky-brown; greater and lesser coverts and scapulars chestnut; throat smoke-gray; pectoral band dull ferruginous; belly and flanks hair-brown, some of the feathers edged and tipped with dull yellowish-ferruginous; under tail-coverts chestnut; tail blackish edged with chestnut; iris hazel; tarsus dusky; † culmen dusky; mandible yellowish toward base, dusky at tip.

*Measurements*.—Type, adult ♀: Wing, 82.6; tail, 56.4; tarsus, 23; exposed culmen, 21.8. No. 5684, ♀ adult, from Palomina: Wing, 83; tail, 56; tarsus, 23.2; exposed culmen, 21.

*Remarks*.—The second specimen (the type) of this form secured by Mr. Brown is just like the first, which could not be referred to either *S. canigularis* or *S. albigularis*.‡ I therefore no longer hesitate to give it a name.

***Siptornis antisiensis* ScL.**

Five specimens, from Santa Cruz, Paramo de Macotama, and Paramo de Chiruqua.

***Siptornis wyatti* ScL. and Salv.**

Two specimens, male and female, from Paramo de Chiruqua, 15,000 feet, Mar. 25, 1899.

***Automolus rufpectus* Bangs.**

Seven specimens, taken at different altitudes from 3,000 to 7,500 feet. All are similar to the type, which before was unique.

***Anabazenops striaticollis* ScL.**

Eight specimens, from Chirua, San Miguel, and La Concepcion.

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\* Mr. Brown took a female at Palomina, May 18, 1898.

† Noted by Mr. Brown from fresh specimen.

‡ Proc. Biol. Soc. Washington, vol. XII, p 177, 1898.

***Premnoplex brunnescens* (Scl.).**

Two females, one from San Miguel, the other from Chirua.

***Dendrocinclla olivacea anguina* Bangs.**

Three specimens, one each from Palomina, Chirua, and La Concepcion. All are similar to the type, the only specimen Mr. Brown had previously taken.

***Picolaptes lacrymiger* (Des Murs.).**

One female from La Concepcion.

***Drymophila caudata* (Scl.).**

Twenty-five specimens, young and adult of both sexes, from Chirua, La Concepcion, San Francisco, Santa Cruz, San Antonio, and San Miguel. I am now inclined to consider the Santa Marta bird true *D. caudata* (Scl.), although when I recorded the first two, taken by Mr. Brown at Palomina,\* I thought that they were not that species. The tails are about the same throughout the series and do not differ, to any extent, with age or sex. The rectrices are dark brown (between raw umber and bister), with subapical black bands and white tips. The only specimen from 'Bogota' in the National Museum has a precisely similar tail. Sclater's description reads: 'Tail of ten feathers, very long, much graduated, black, with white ends.' This was probably a mistake.

***Conopophaga browni* † sp. nov.**

Five specimens, both sexes, from Chirua.

*Type*, from Chirua, Colombia; altitude, 7,000 feet. No. 6177, ♂ adult, coll. of E. A. and O. Bangs. Collected Feb. 12, 1899, by W. W. Brown, Jr.

*Specific characters*.—A very distinct species, apparently representing a new group, having sides of head and cap like the back and without white post-ocular stripe or patch.

*Color*.—Forehead tawny-olive, passing insensibly into color of upper parts; lores yellowish white; upper parts, yellowish olive; wings dusky brown, outer edges of primaries, secondaries, and tertials dull olivaceous cinnamon; tertials and secondaries bordered on inner web and tipped with clear cinnamon; tail sepia; a narrow orbital ring yellowish white; auriculars reddish olive; throat, breast, sides, and lining of wing ochraceous (in some specimens there is some white on the throat, in others the throat is uniform with the breast); middle of belly and under tail-coverts white, varying in extent in different specimens; culmen dusky; mandible yellowish toward base, dusky at tip.

*Measurements*.—Type, adult ♂: Wing, 61; tail, 29; tarsus, 23.2; ex-

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\* Proc. Biol. Soc. Washington, vol. XII, p. 176, 1898.

† Named for Wilmot W. Brown, Jr., whose researches have brought to light so many new birds in the Santa Marta region.



posed culmen, 13. Adult ♀, No. 6179, topotype: Wing, 62; tail, 29.4; tarsus, 23.6; exposed culmen, 12.4.

*Remarks.*—*C. browni* does not need comparison with any known form. The one female recorded from Pueblo Viejo, 8,000 feet,\* is like the present series from Chirua.

***Scytalopus sylvestris* Tacz.**

One male, not fully adult, from San Francisco Jan. 24, 1899. It is not unlikely that fully adult specimens will show the Santa Marta bird to be an undescribed species. The wing measures 46 mm., which is shorter than usual in *S. sylvestris*. I have compared it with *S. argentifrons* Ridgw., and it is certainly not that species. For the present it may be well to call it *sylvestris*.

***Scytalopus latebricola* † sp. nov.**

Seven specimens, six females and one male, from Paramo de Chiriqua and Paramo de Macotama, 11,000 to 12,000 feet.

*Type*, from Paramo de Chiriqua, Colombia; altitude, 12,000 feet. No. 6208, ♀ adult, coll. of E. A. and O. Bangs. Collected March 10, 1899, by W. W. Brown, Jr.

*Specific characters.*—*Scytalopus latebricola* has the large feet, tarsus, and bill of the *S. analis* group, but in size is smaller and has a much shorter tail than *S. analis*. Colors different, much more reddish brown on rump, flanks, and upper tail-coverts. Sexes apparently alike.

*Color.*—Adult, head and back dark brownish slate; lower rump and upper tail-coverts chestnut, with indistinct blackish cross-bars; wings and tail dull brownish black; throat and breast brownish slate gray (almost mouse gray of Ridgway), paler and more silvery on middle of lower breast and upper part of belly; flanks, lower sides, and under tail-coverts chestnut, with slight irregular spots and cross-bars of dusky; bill horn color; feet and tarsus brown.

Younger birds (Nos. 6212 and 6210) differ in having more chestnut on the back and breast, in being more decidedly barred on flanks, etc., and in having tertials and wing-coverts barred with chestnut and tipped with yellowish brown, and primaries edged with chestnut.

*Measurements.*

No.	Sex.	Wing.	Tail.	Tarsus.	Exposed culmen.
6208, type. ....	♀ ad.	60.	42.2	23.8	13.4
6211. ....	♀ ad.	61.	42.6	24.2	13.4
6213. ....	♂ ad.	62.	.....	24.4	13.6

\* Proc. Biol. Soc. Washington, vol. XII, p. 159, 1898.

† *Latebricola*, one who dwells in coverts or lurking-places.

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*Remarks.*—I have carefully examined Lafresnaye's type of *Merulaxis analis*, which is in fairly good condition. It is a very different bird from that taken by Mr. Brown in the Sierra Nevada de Santa Marta; is much larger and has a very much longer tail. The colors are also different, but as the specimen appears to be now somewhat faded by exposure to light, it might only make confusion to mention these differences. It measures—wing, 66; tail, 63.2; tarsus, 28.

In the National Museum I examined specimens from Bogota of still another form, which is probably *S. micropterus* (Scl.). This differs from *S. latebricola* in being much darker throughout, the back blacker, the underparts not nearly so gray, and the reddish brown of the flanks and rump darker.

***Sycalis browni* Bangs.**

Two specimens, one adult (female?), the other a young male, from Palomina and La Concepcion.

When identifying the specimens of this bird which Mr. Brown took near Santa Marta, Mr. Ridgway and I were misled by Dr. Sharpe's rather strange treatment of *Sycalis citrina*, which is placed in the far-removed genus *Pseudochloris*. Consequently we overlooked that species.

There is little doubt that the birds recorded in the 'British Museum Catalogue' from Colombia are the same as my *S. browni*. It is probable, however, that *S. browni* will prove subspecifically different from *S. citrina* Pelzeln, the latter being based on birds from southern Brazil. It would in fact be very strange if birds of this sort from localities so far apart as southern Brazil and northern Colombia should not prove different. In the lack of Brazilian specimens for actual comparison, I am forced to leave the question in this unsatisfactory condition.

***Oryzoborus funereus* Scl.**

Five specimens from Chirua and La Concepcion.

***Catamenia* sp. ?**

One female from Paramo de Chiriqua, 15,000 feet, Feb. 27, 1899.

With but one female I am unable to identify the species positively. It may prove to be undescribed or may possibly be *C. analoides*.

***Haplospiza nivaria* \* sp. nov.**

Thirteen specimens from Paramo de Chiriqua, 15,000 feet, Feb. and Mar. 1899.

*Type*, from Paramo de Chiriqua, Colombia; altitude, 15,000 feet. No. 6238, ♂ adult, coll. of E. A. and O. Bangs. Collected Mar. 25, 1899, by W. W. Brown, Jr.

*Specific characters.*—Much larger than *H. unicolor*; ♂ purer gray, less olivaceous; back more streaked; bill relatively smaller. The feathers

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\* *Nivarius*, of or belonging to snow.

everywhere very long and lax, and the whole plumage indicating a bird fitted to withstand extreme cold.

*Color*.—Adult ♂: Upper parts dark gray, between mouse gray and slate color; interscapulum with indistinct longitudinal dusky streaks; some of the feathers slightly edged with pale smoke gray; wings black, all the feathers edged with gray like the back; tail black, with narrow gray edges; under parts gray (No. 6 of Ridgway); center of belly and under tail coverts somewhat varied by indistinct cross-bars of pale smoke gray; bill, feet, and tarsus black; iris hazel.\*

Adult ♀: Heavily streaked throughout; upper parts sepia, rather paler on cervix and shading into brownish slate on rump and upper tail-coverts, with broad blackish striations; wings dusky brown edged with sepia, except greater and middle coverts, which are edged with isabella color; tail dusky brown edged with grayish; throat, breast, flanks, and sides wood brown; belly and under tail-coverts grayish white; under parts streaked throughout with blackish, most heavily on breast and sides, less so on throat and center of belly; bill blackish, base of lower mandible paler, more yellowish.

*Measurements.*

No.	Sex.	Wing.	Tail.	Tarsus.	Exposed culmen.
6238, type.....	♂ ad.	82.	59.	23.	10.
6240.....	♂ ad.	83.	60.	23.	10.2
6246.....	♀ ad.	81.	59.	23.4	10.
6244.....	♀ ad.	82.	57.	23.4	10.2

*Remarks*.—I am, of course, not familiar with *H. uniformis* Scl. and Salv. of Jalapa, Mexico, the type being unique, but the description indicates a very different bird from mine, and the measurements show it to be smaller.

Mr. Brown found the new species at the edge of snow, at 15,000 feet, on El Paramo de Chiruqua, where he took thirteen specimens in Feb. and March, 1899. At no other station in the mountains did he get specimens. Some of the birds taken in February were moulting.

***Myospiza manimbe* (Licht.).**

One female from Paramo de Macotama, 9,000 feet, Mar. 3, 1899.

***Arremonops caneus* † Bangs.**

At Mr. Ridgway's request I sent him, a short time ago, the three specimens upon which I based this form. He detected an error in my former

\*Noted by Mr. Brown from fresh specimens.

†Described as *Arremonops conirostris caneus* Bangs, Proc. Biol. Soc., Washington, vol. XII, p. 140, June 3, 1898.

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account of them that must be corrected. The type, adult male, is all right, and is so different from *A. conirostris* as to deserve full specific rank. The two females that I included under the same name, however, prove not to belong to this species at all, but are so close to examples of *A. venezuelensis* Ridgway, that Mr. Ridgway does not consider them even subspecifically separable. Thus another species should be added to the fauna of the Sierra Nevada de Santa Marta.

***Arremonops venezuelensis* Ridgw.**

Two females taken near Santa Marta in Jan., 1898. This is a much smaller bird than *A. caneus*, besides being different in color. The back is pure greenish olive, this color also suffusing the gray of neck and crown. *A. caneus* has the whole head (between black stripes), neck, and upper back gray, gradually shading into grayish olive on lower back and rump.

***Buarremon basilicus* Bangs.**

Four specimens, three males and one female, from Chirua and San Francisco. I founded this species upon one adult male taken at Pueblo Viejo at an altitude of 8,000 feet, and the three males in the present series agree with it exactly. The female is rather smaller and slightly different in color, the main difference being that the olive of the back extends up the crown between the two black stripes. In the males this central crown stripe is gray.

***Schistochlamys atra* (Gmel.).**

Eleven specimens, both sexes, from La Concepcion and San Antonio.

***Pœcilothraupis melanogenys* Salv. and Godm.**

Twenty specimens, taken at all stations between 7,500 and 12,000 feet. Of this beautiful tanager, peculiar to the Santa Marta mountains, Mr. Brown had before taken but one specimen.

***Chlorophonia frontalis* (Sc.).**

Ten specimens, both sexes, from Chirua, La Concepcion, and San Miguel. Without specimens from Venezuela for comparison, I must let the Santa Marta bird stand as *C. frontalis*.

***Piranga faceta* Bangs.**

Four examples, one adult male and three young males, from La Concepcion and San Miguel. The adult is in every way similar to the type, but is in much more worn plumage. The young males are in a plumage similar to that of the adult female, except that orange red feathers are appearing in small irregular patches both above and below.

***Atticora cyanoleuca* (Vieill.).**

Seven specimens, both sexes, all from La Concepcion; altitude, 3,000 feet.

***Vireo josephæ* (Scl.).**

One male from El Paramo de Macotama. 11,000 feet, Feb. 3, 1899.

***Conirostrum rufum* Lafr.**

Five specimens, both sexes, from Paramo de Chirua and Paramo de Macotama; altitude, 11,000 feet.

***Helminthophila pinus* (Linn.).**

One adult male, Chirua, Mar. 21, 1899. This bird is interesting, having broad, conspicuous yellow wing bars.

***Seiurus noveboracensis* (Gmel.).**

Two specimens; male from La Concepcion, Mar. 17, 1899, and a female from Chirua, Feb. 13, 1899.

***Seiurus noveboracensis notabilis* (Ridgw.).**

One male from Chirua, Feb. 7, 1899.

***Geothlypis philadelphia* (Wils.).**

Ten specimens, both sexes, from Chirua and La Concepcion, taken from Feb. 12 to Mar. 25, 1899. Most of these birds are molting, and the series covers practically the complete spring molt.

***Cinclus rivularis* \* sp. nov.**

Three specimens, two from Chirua, one from Paramo de Chirua; altitude, 11,000 feet.

*Type*, from Chirua, Colombia; altitude, 7,000 feet. No. 6049; ♂ adult, coll. of E. A. and O. Bangs. Collected Feb. 7, 1899, by W. W. Brown, Jr.

*Specific characters*.—Not much like either *C. leucomotus* or *C. leucocephalus*; general color more grayish and less blackish; under parts dark gray mottled with white; pileum white streaked with dusky; throat white; cheeks dark gray.

*Color*.—Pileum white, the center of the feathers dusky, giving a streaked appearance; back slate color, the lower parts of the feathers white centrally (the white does not show unless the feathers are disturbed); rump and upper tail-coverts dark brownish slate color; wings brownish black, inner webs of primaries and secondaries with white central spots, this white marking small and inconspicuous on second and third primaries,

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\* *Rivularis*, of or belonging to a small stream, rivulet.

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larger on the other feathers; tail brownish black; cheeks dark slate; throat white; breast, belly, and under tail-coverts dark slate, irregularly mottled and varied with white. (In the type there is but little white, mostly concealed, on under parts; in a topotype there is rather more; in the specimen from Paramo de Chiriqua the center of breast and belly is considerably mottled with white). Flanks and sides brownish slate; 'front of tarsus light blue, behind dusky; iris hazel; '\* bill black.

*Measurements.*—Type, adult ♂: Wing, 88; tail, 47; tarsus, 30.6; exposed culmen, 12. Adult ♀, No. 6050, from Paramo de Chiriqua: Wing, 82; tail, 44; tarsus, 29.4; exposed culmen, 12.

***Troglodytes monticola* † sp. nov.**

Five specimens, adult male and female, and three young, from Paramo de Chiriqua and Paramo de Macotama, from 11,000 to 15,000 feet.

*Type* from Paramo de Chiriqua, Colombia; altitude, 15,000 feet. No. 6066, ♀ adult, coll. of E. A. and O. Bangs. Collected Mar. 25, 1899, by W. W. Brown, Jr.

*Specific characters.*—With a distinct superciliary streak as in *T. brunnei-collis* of southern Mexico and *T. rufociliatus* of Guatemala. Larger than either of these and differing much in color and markings.

*Color.*—Adult ♀, type, in fresh plumage: Pileum and cervix rich russet; back, rump, upper tail-coverts, scapulars, tertials, and wing-coverts russet, finely, but strongly, barred with dusky; primaries and secondaries dusky, with dull yellowish-white notches along outer webs; tail dusky, with irregular, wavy cross-bars (often broken) of dull grayish brown; conspicuous superciliary streak tawny-ochraceous; auriculars tawny, just behind eye darker, almost dusky; throat and jugulum ending in an even line, dull tawny-ochraceous; breast, in the middle pinkish buff, toward sides buff with dusky cross-bars; belly soiled white, with dusky cross-bars; flanks and sides dull buff, with broad dusky cross-bars; under tail-coverts white, with dusky cross-bars.

An adult ♂, No. 6017, from Paramo de Macotama, Mar. 11, 1899, is similar, but is in worn plumage, the feathers being considerably abraded. The color above is richer, bordering on hazel, and the cross bars on back are less distinct; below it is more deeply colored, and the differences in shade between throat, breast, and belly are less evident. All these differences are probably due to wearing of the feathers.

The young differ from adults in being less barred above and in having the under parts isabella color—a little darker on sides—freckled with dusky. The new feathers appearing on the throat are like those of the adult.

*Measurements.*—Type, adult ♀: Wing, 54; tail, 39.4; tarsus, 21; exposed culmen, 11.8. Adult ♂, No. 6067: Wing, 54; tail, 39.6; tarsus, 22; exposed culmen, 12.2.‡

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\* Noted by Mr. Brown from a fresh specimen—the type.

† *Monticola*, a mountaineer, dweller in the mountains.

‡ The wings and tail of the male are somewhat worn, and therefore these measurements are a little too short.

*Remarks.*—The discovery of this wren in the higher Sierra Nevada carries the range of the group of house wrens having conspicuously colored superciliaries into South America proper. The species is very different from either of the two before known.

***Microcerculus marginatus* Scl.**

One adult male from Chirua, Mar. 13, 1899.

***Hylocihla ustulata swainsoni* (Cab.).**

One female from Chirua, Feb. 16, 1899.

***Merula gigas caczela* Bangs.**

Eighteen specimens, taken at San Miguel, Paramo de Chiruqua, and Paramo de Macotama. All agree with the original pair from Macotama, upon which I based the subspecies.

***Merula olivatra* Lafr.**

Two males from La Concepcion; altitude, 3,000 feet.

I have compared these with the types of *Merula olivatra* which are in the collection of the Boston Society of Natural History. There are two specimens in fine condition and apparently only a little faded, though they were for some years exposed to the light as mounted specimens. In color they agree with the two skins taken by Mr. Brown, when due allowance is made for the slight fading that has undoubtedly taken place. They are, however, smaller in every proportion. The wing measurement of the two Lafresnaye types is 115 and 118 mm. respectively, while in the La Concepcion birds, both males, it is 122 and 124 mm.

When we know more about the range and variations of this rare thrush it may be found that there are two races. For the present I prefer to leave the Colombian bird with true *M. olivatra*.

***Merula albiventris fusa* \* subsp. nov.**

Fourteen specimens, both sexes, from Chirua, La Concepcion, San Miguel, and San Francisco. Taken in Jan., Feb., and Mar., 1899.

*Type*, from Chirua, Colombia; altitude, 7,000 feet. No. 6080, ♀ adult, coll. of E. A. and O. Bangs. Collected Feb. 11, 1899, by W. W. Brown, Jr.

*Subspecific characters.*—Much larger than true *M. albiventris* Spix, of Brazil; colors and pattern of coloration similar, except that the head is grayer—shading from grayish olive on forehead and crown to olive gray on cervix, where the gray meets the olive of the back much more abruptly. ' Bill dull green; iris brown; '† sexes alike.

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\* *Fusus*, large, plump, full.

† Noted by Mr. Brown from fresh specimen.

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*Measurements.*

No.	Sex.	Wing.	Tail.	Tarsus.	Exposed culmen.
6080, type.....	♀ ad.	124	103	32.5	19.5
6071.....	♂ ad.	121.5	100	32	20
6074.....	♂ ad.	122	99.5	31.5	20
6076.....	♂ ad.	120	98.5	32.5	19.5
6079.....	♀ ad.	120.5	103	32	20
6078.....	♂ ad.	120.5	100	32.5	20
6072.....	♂ ad.	119.5	98	33	19.5
6073.....	♀ ad.	118	96	31	19.5
6075.....	♀ ad.	117.5	96	31.5	20
6077.....	♂ ad.	119	96	32	19.5

*Remarks.*—This new form of the white-bellied thrush is in all probability not confined to the Sierra Nevada de Santa Marta, but is a large northern subspecies. True *M. albiventris* of Brazil is a much smaller bird, besides differing somewhat in the color of the head. The young bird, in nestling plumage, from Palomina, taken May 21, 1898; that I recorded as probably the young of *Merula incompta*,\* proves on examination to be the young of *M. albiventris fusa*.

***Merula phæopyga minuscula* Bangs.**

Ten specimens, nine males and one female, from La Concepcion and Chirua. All these agree closely with the original specimens.

***Platycichla flavipes carbonaria* (Licht.).**

Seven specimens, both sexes, from Chirua, La Concepcion, and San Miguel.

***Catharus fuscater* (Laf.).**

One adult male from Chirua, Feb. 5, 1899. 'Iris white; orbital ring reddish orange; bill reddish orange, but apex of culmen dusky; tarsus light orange.' †

\* Proc. Biol. Soc. Washington, vol. XII, p. 182, 1898.

† Noted by Mr. Brown from the fresh specimen.



PROCEEDINGS  
OF THE  
BIOLOGICAL SOCIETY OF WASHINGTON

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THE BOTANICAL EXPLORATIONS  
OF  
THOMAS NUTTALL IN CALIFORNIA.

BY FREDERICK V. COVILLE.

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I was puzzled recently, in reading some references to Thomas Nuttall's botanical work in California, at discrepancies in various statements regarding time and place, and this led to a careful examination of the available records regarding his work in that State.

Professor W. H. Brewer,\* to whom one naturally turns for information about botanical explorations in California, states that Nuttall's collections there were made "during a part of the year 1835." This there was reason to doubt, and looking further I found that Professor Brewer's authority for the statement was probably Elias Durand's "Biographical notice of the late Thomas Nuttall."†

In this article Durand states, on page 311:

"There [at the Sandwich Islands] he remained a couple of months [after January 5, 1835], visiting the different islands of that happy group and collecting plants and sea-shells; thence, separating from his companion, Mr. [John K.] Townsend, he took passage on board a vessel sailing for the coast of California, where he landed early in the spring, to enjoy new emotions of pleasure. All again was new to him! He remained in California a great part of the spring and summer, actively engaged in making collections, and returned to the Sandwich Islands,

\* In Brewer & Watson, Bot. Cal., II, 555, 1880.

† Proc. Am. Phil. Soc., VII, 297-315, 1861.

where he embarked on a Boston vessel to come back to the United States round Cape Horn. Mr. Nuttall arrived in Boston in the beginning of October, 1835."

This statement of Durand, it now appears, is incorrect in that Nuttall did not separate from Townsend in the Hawaiian Islands, did not sail at this time for California, did not spend the following spring and summer in California, did not embark for Boston from the Hawaiian Islands, and did not reach Boston in 1835.\*

Nuttall, in company with Townsend, embarked at Honolulu, Hawaiian Islands, March 26, 1835, on the American brig *May Dacre* and entered the mouth of the Columbia on April 16 following.†

Under date of July 11, 1835, Mr. Townsend states ‡ that Nuttall "has just returned from the Dalles, where he has been spending some weeks." Under date of October 1, 1835, referring to a Hudson Bay Company's vessel in which Dr. Gairdner, one of the company's surgeons, had sailed a few days before from the mouth of the Columbia to the Hawaiian Islands, Townsend says:

"My companion, Mr. Nuttall, was also a passenger in the same vessel. From the [Hawaiian] islands he will probably visit California, and either return to the Columbia by the next ship and take the route across the mountains or double Cape Horn to reach his home."

From the records thus cited it is evident that Nuttall spent the spring and summer of 1835 on the Columbia River in Oregon and Washington, not in California. It may seem strange to the reader that Nuttall, wishing to go to California from the Columbia, did not make the journey overland, or at least take a vessel down the coast. The fact is that he did not do this simply because he could not. Up to that time there was no land route from the Willamette to the Sacramento across the mountains of the Umpqua and the Rogue rivers and the terrible Siskiyou. As for a coastwise vessel from the Columbia to a California port, that was a rare occurrence. The trade of the

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\*Since this article was written Dr. John W. Harshberger's book on "The Botanists of Philadelphia and Their Work" has appeared, with the same errors, doubtless also on the authority of Durand.

†Townsend, John K. Narrative of a journey across the Rocky Mountains, etc., pages 215, 218, 1839.

‡Op. cit., 224.

Columbia was exclusively a fur trade, and, while the trading vessels went frequently to the Hawaiian Islands to get provisions or sometimes to take on a cargo of sandal-wood for delivery at some eastern Asiatic port, they seldom had occasion to stop in California as they sailed to or from Cape Horn.

Of Nuttall's movements immediately after the 1st of October, 1835, we have only an indirect record. Presumably he reached Honolulu, as he intended, and certainly he must have sailed almost immediately for California, for his collections from the Hawaiian Islands are very scanty and probably, indeed, were all made during his previous visit there.

In the absence of any direct account of Nuttall's movements in California, it seemed best to collate the type localities of the new species of plants described by him as collected in that State, and with this in view a search has been made through the works in which most of these California collections were published, namely, the seventh and eighth volumes of the Transactions of the American Philosophical Society, new series, 1840 to 1843, and in Torrey and Gray's Flora of North America, 1838 to 1843. As a result, it appears that Nuttall's California collections were made at Monterey, Santa Barbara, San Pedro (the port of Los Angeles), and San Diego, in March, April, and May, 1836. He did not visit the California coast north of Monterey.

At San Diego Nuttall secured passage for Boston on the vessel *Alert*, which was carrying a load of hides from California to New England by way of Cape Horn. She left San Diego May 8, 1836. This voyage has an added interest from the fact that the vessel carried also the Massachusetts boy, R. H. Dana, who afterward wrote "Two Years before the Mast." His references to Nuttall are interesting.

"This passenger, the first and only one we had had [on board the trading vessel *Alert*, of Boston], except to go from port to port, on the coast, was no one else than a gentleman whom I had known in my better days, and the last person I should have expected to have seen on the coast of California, Professor [Thomas] Nuttall, of Cambridge, [Massachusetts]. I had left him quietly seated in the chair of Botany and Ornithology, in Harvard University, and the next I saw of him was strolling about San Diego beach, California, in a sailor's pea-jacket, with a wide straw hat, and barefooted, with his trousers rolled up to his knees, picking up stones and shells. He had traveled overland to the Northwest Coast, and come down in a small vessel to Monterey. [Dana evidently knew nothing about Nuttall's trips to the Hawaiian Islands.] There he learned that

there was a ship at the leeward about to sail for Boston, and, taking passage in the *Pilgrim*, which was then at Monterey, he came slowly down, visiting the intermediate ports and examining the trees, plants, earths, birds, &c., and joined us at San Diego shortly before we sailed. The second mate of the *Pilgrim* told me that they had got an old gentleman on board who knew me and came from the college that I had been in. He could not recollect his name, but said he was a 'sort of an oldish man,' with white hair, and spent all his time in the bush and along the beach, picking up flowers and shells and such truck, and had a dozen boxes and barrels full of them. I thought over everybody who would be likely to be there, but could fix upon no one, when, the next day, just as we were about to shove off from the beach, he came down to the boat in the rig I have described, with his shoes in his hand and his pockets full of specimens. I knew him at once, though I should not have been more surprised to have seen the Old South steeple shoot up from the hide-house.

He probably had no less difficulty in recognizing me. As we left home about the same time, we had nothing to tell one another; and, owing to our different situations on board [Dana had shipped as a common sailor, in the forecabin], I saw but little of him on the passage home. Sometimes, when I was at the wheel of a calm night, and the steering required no attention, and the officer of the watch was forward, he would come aft and hold a short yarn with me; but this was against the rules of the ship, as is, in fact, all intercourse between passengers and the crew. I was often amused to see the sailors puzzled to know what to make of him, and to hear their conjectures about him and his business. They were as much puzzled as our old sailmaker was with the captain's instruments in the cabin. He said there were three: the *chronometer*, the *chrenometer*, and *thenometer* (chronometer, barometer, and thermometer). The *Pilgrim's* crew christened Mr. Nuttall "Old Curious," from his zeal for curiosities, and some of them said that he was crazy, and that his friends let him go about and amuse himself in this way. Why else a rich man (sailors call every man rich who does not work with his hands and wears a long coat and cravat) should leave a Christian country, and come to such a place as California, to pick up shells and stones, they could not understand. One of them, however, an old salt who had seen something more of the world ashore, set all to rights, as he thought: 'Oh, 'vast there! You don't know anything about them craft. I've seen them colleges, and know the ropes. They keep all such things for curiosities, and study 'em, and have men a' purpose to go and get 'em. This old chap knows what he's about. He a'n't the child you take him for. He'll carry all these things to the college, and if they are better than any that they have had before, he'll be head of the college. Then, by-and-by, somebody else will go after some more, and if they beat him, he'll have to go again, or else give up his berth. That's the way they do it. This old covey knows the ropes. He has worked a traverse over 'em, and come 'way out here, where nobody's ever been afore, and where they'll never think of coming.' This explanation satisfied Jack; and as it raised Mr. Nuttall's credit for

capacity, and was near enough to the truth for common purposes, I did not disturb it. With the exception of Mr. Nuttall, we had no one on board but the regular ship's company, and the live stock." \*

On July 22, 1836, after a hard and protracted storm off the southern coast of South America, Dana states :

" Even Mr. Nuttall, the passenger, who had kept in his shell for nearly a month, and hardly been seen by anybody, and who we had almost forgotten was on board, came out like a butterfly, and was hopping around as bright as a bird." †

And again :

" In the general joy, Mr. Nuttall said he should like to go ashore upon the island [Staten Island, a little east of Cape Horn] and examine a spot which probably no human being had ever set foot upon ; but the captain intimated that he would see the island—specimens and all—in—another place before he would get out a boat or delay the ship one moment for him." ‡

On the 21st of September, 1836, Nuttall arrived in Boston, thus ending his last important American journey.

It is important that the new species based on Nuttall's Californian collections be critically identified, and since to many Californian botanists both the type specimens and the original descriptions are not readily accessible, the following list of species has been prepared. The list, arranged by type localities, includes the species described in Torrey and Gray's *Flora of North America*, 1838 to 1843, and in the seventh and eighth volumes of the *Transactions of the American Philosophical Society*, new series, 1840 to 1843. After the original name is given the current equivalent, if different from the original, and any additional information suggested by the first description, such as the habitat, precise locality, date of collecting or flowering, probable misidentification, or incorrect use of a name. No attempt has been made to identify the species critically. It is hoped that this information will be used by Californian botanists in making collections of these plants at their type localities, so that ample material for careful study may be available in American herbaria.

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\* [Dana, R. H.] *Two Years before the Mast*, 359-361, 1840.

† *Op. cit.*, 412.

‡ *Op. cit.*, 412-413.

LIST OF PRINCIPAL NEW SPECIES BASED ON NUTTALL'S  
CALIFORNIAN COLLECTIONS.

*Collected at Monterey.*

BRASSICACEAE.

**Dentaria integrifolia** Nutt. Plains of Monterey.

**Erysimum grandiflorum** Nutt. = *Cheiranthus capitatus* Dougl. On the sand hills of Point Pinos, near Monterey. March.

**Lepidium californicum** Nutt. = *Lepidium menziesii* DC. It may be well to note that although *L. californicum* is referred by recent authors to *L. menziesii*, the latter is considered by Dr. Robinson in the Synoptical Flora a plant of the Northwest Coast, a district far removed phytogeographically from Monterey. This suggests the need of further critical examination of the Monterey plant.

VICIACEAE.

**Drepanolobus lanatus** Nutt. = *Lotus tomentosus* (Hook. & Arn.) Greene. Dry hills in the shade, near Monterey.

**Hosackia micranthus** [-tha] Nutt. = *Lotus hamatus* Greene. Near Monterey, March to April.

**Hosackia nudiflora** Nutt. = *Lotus nudiflorus* (Nutt.) Greene. Gravelly hills near Monterey, March.

**Hosackia strigosa** Nutt. = *Lotus strigosus* (Nutt.) Greene. Dry gravelly hills near Monterey, March.

RHAMNACEAE.

**Ceanothus rigidus** Nutt. Bushy woods near Monterey, March.

**Rhamnus croceus** [-cea] Nutt. Bushy hills and thickets around Monterey.

**Rhamnus laurifolius** [ia] Nutt. = *Rhamnus californica* Esch. The type specimens were collected near Monterey and near Santa Barbara also.

CISTACEAE.

**Helianthemum scoparium** Nutt. Common on dry hills around Monterey.

ONAGRACEAE.

**Oenothera ovata** Nutt. = *Taraxia ovata* (Nutt.) Small. Common in moist plains in the immediate vicinity of Monterey, March.

ERICACEAE.

**Arctostaphylos acuta** Nutt. = *Arctostaphylos pumila* Nutt., with which it was originally collected.

**Arctostaphylos pumila** Nutt. Around Monterey, flowering in March and April.

**Xylococcus bicolor** Nutt. = *Arctostaphylos bicolor* (Nutt.) Gray. This was the type species of Nuttall's genus *Xylococcus*.

CARDUACEAE.

**Artemisia foliosa** Nutt. = *Artemisia californica* Less. Common around Monterey.

**Stylocline gnaphaloides** Nutt. Near Monterey.

*Collected at Santa Barbara.*

RANUNCULACEAE.

**Paeonia californica** Nutt. Margins of bushy plains and in the mountain valleys in the vicinity of Santa Barbara, March and April.

**Lepidium lasiocarpum** Nutt. Near Santa Barbara.

**Lepidium nitidum** Nutt. Near Santa Barbara.

**Streptanthus arcuatus** Nutt. = *Arabis arcuata* (Nutt.) Gray. Shelving rocks on high hills near Santa Barbara.

**Streptanthus repandus** Nutt. This plant has remained unidentified since the publication of Nuttall's original description, and no mention of the plant is made by Dr. Watson in the Synoptical Flora. Nuttall's original description is as follows:

"Hirsute, particularly the lower part; leaves oblong-lanceolate, elongated, clasping, angularly toothed or repand above (flowers white); petals about as long as the calyx. St. Barbara, Upper California. Stem simple, about 2 feet high. Pedicels shorter than the calyx. Sepals and petals linear."

**Thysanocarpus crenatus** Nutt. This plant and the following are usually treated as belonging to the same species, *crenatus* being made a variety of *laciniatus*. *Crenatus*, however, by the rule of precedence is the proper specific name.

**Thysanocarpus laciniatus** Nutt. See remarks under the preceding.

RESEDACEAE.

**Ellimia ruderalis** Nutt. = *Dipetalia subulata* (Del.) Kuntze. This plant was the type of Nuttall's genus *Ellimia*.

SAXIFRAGACEAE.

**Lithophragma cymbalaria** Torr. & Gr. Shady woods near Santa Barbara.

RIBACEAE.

**Ribes villosum** Nutt. This is commonly referred to *Ribes divaricatum* Dougl., a species of the Northwest Coast. Nuttall found it common on the plain near the village of Santa Barbara.

## ROSACEAE.

***Alchemilla cuneifolia* Nutt.** Referred by most authors to *Alchemilla arvensis* (L.) Scop. Professor Greene, however, in *Flora Franciscana*, page 62, maintains it as distinct from that species, basing his opinion on Nuttall's description. It was originally collected on "dry plains, St. [Santa] Barbara."

***Cercocarpus betuloides* Nutt.** Mountains of Santa Barbara, April.

## VICIACEAE.

***Amorpha californica* Nutt.** Near the coast, May.

***Hosackia crassifolia* Nutt.** Dr. Gray referred this plant to *Hosackia scoparia* Nutt. as a new variety, *diffusa*. Professor Greene in publishing his *Lotus glaber* (Pittonia 2: 148, 1890) cited *Hosackia scoparia* Nutt. as a synonym, but made no mention of the variety or of Nuttall's *Hosackia crassifolia*. It was collected by Nuttall on dry hillsides near the sea.

***Hosackia maritima* Nutt. = *Lotus saluginosus* Greene.** Clayey soils and on broken declivities near the sea, March.

***Hosackia ochroleuca* Nutt. = *Lotus grandiflorus* (Benth.) Greene.** Shady mountain woods near Santa Barbara, March to April.

***Hosackia prostratus* [-ta] Nutt. = *Lotus nuttallianus* Greene.** Plains near the sea, Santa Barbara, April, and also at San Diego.

***Hosackia scoparia* Nutt. = *Lotus glaber* (Vogel) Greene.** Dry hillsides near the sea, March to April.

***Phaca canescens* Nutt. = *Astragalus leucopsis* (Torr. & Gr.) Torr.** Borders of woods near the sea.

***Phaca tricopoda* Nutt. = *Astragalus tricopodus* (Nutt.) Gray.** Borders of woods near the sea, April.

***Pickeringia montana* Nutt. = *Xylothermia montana* (Nutt.) Greene.** Summits of the mountains in the vicinity of Santa Barbara. This was the type of Nuttall's genus *Pickeringia*.

***Trifolium aciculare* Nutt.** Plains of Santa Barbara, March to April.

***Trifolium polyphyllum* Nutt.** This is one of the clovers that have been referred by various authors, without sufficiently critical examination, to *Trifolium tridentatum* Lindl. Woods around Santa Barbara, April.

***Trifolium spinulosum triste* Torr. & Gr.** This plant is identified by Professor Greene with *Trifolium variegatum majus* Loja, a reference which, if maintained, requires a change in the varietal name.

## ANACARDIACEAE.

***Rhus laurina* Nutt.** On bushy plains near Santa Barbara.

***Styphonia integrifolia* Nutt. = *Rhus integrifolia* (Nutt.) Benth. & Hook.** Common on the margins of cliffs near the sea around Santa Barbara and also at San Diego.

***Styphonia serrata* Nutt. = *Rhus integrifolia* (Nutt.) Benth. & Hook.,** with which it was originally collected.



RHAMNACEAE.

**Ceanothus divaricatus** Nutt. Near the town of Santa Barbara and in the neighboring mountains, April.

**Ceanothus hirsutus** Nutt. In thickets. See note under *Ceanothus oliganthus*.

**Ceanothus macrocarpus** Nutt. Mountains of Santa Barbara.

**Ceanothus oliganthus** Nutt. Bushy woods on the hills of Santa Barbara. As indicated by Professor Greene in *Flora Franciscana*, page 85, the name *oliganthus* has precedence over *hirsutus* and should be used in case the two plants prove to belong to the same species.

**Ceanothus spinosus** Nutt. Mountains of Santa Barbara.

MALVACEAE.

**Malva fasciculata** Nutt. = *Malvastrum fasciculatum* (Nutt.) Greene.

**Sida californica** Nutt. = *Sidalcea californica* (Nutt.) Gray.

**Sida delphinifolia** Nutt. = *Sidalcea delphinifolia* (Nutt.) Greene.

APIACEAE.

**Leptotaenia californica** Nutt.

CAMPANULACEAE.

**Dysmicodon californicum** Nutt. = *Legouzia biflora* (Ruiz & Pavon) Britton. In shady woods near Santa Barbara.

CARDUACEAE.

**Artemisia abrotanoides** Nutt. = *Artemisia californica* Less. Near Santa Barbara.

**Bahia trifida** Nutt. = *Eriophyllum confertiflorum trifidum* (Nutt.) Gray.

**Burrielia hirsuta** Nutt. = *Baeria gracilis* (DC.) Gray.

**Burrielia longifolia** Nutt. = *Baeria gracilis* (DC.) Gray. Near Santa Barbara.

**Burrielia parviflora** Nutt. = *Baeria gracilis* (DC.) Gray. With the last.

**Chrysopsis sessiliflora** Nutt. Flowering in April.

**Carduus occidentalis** Nutt. Around Santa Barbara.

**Dichaeta tenella** Nutt. = *Baeria tenella* (Nutt.) Greene. On the margins of ponds and wet places, flowering in April.

**Encelia californica** Nutt. Common on dry hills near Santa Barbara, flowering in April.

**Erigeron foliosum** [us] Nutt. Near Santa Barbara, flowering in May.

**Erigeron hispidum** [us] Nutt. = *Erigeron glaucus* Ker.

**Gnaphalium californicum erubescens** Nutt. Identified by Dr. Gray in the Synoptical Flora as a form of *G. ramosissimum* Nutt., which is a later name. Near Santa Barbara.

**Grindelia cuneifolia** Nutt.

**Hetherotheca grandiflora** Nutt. On rocks near the sea, around Santa Barbara.

**Isocoma vernonioides** Nutt. Common in marshes near the sea, flowering in April and May.

**Madaroglossa elegans** Nutt. = *Blepharipappus elegans* (Nutt.) Greene.

**Madaroglossa hirsuta** Nutt. = *Blepharipappus platyglossus* (Fisch. & Mey.) Greene. Also at Monterey.

**Madaroglossa angustifolia** Nutt. = *Blepharipappus platyglossus* (Fisch. & Mey.) Greene. Collected at Monterey.

**Micropus angustifolius** Nutt. = *Micropus californicus* Fisch. & Mey.

**Psilocarphus globiferus** Nutt. Around Santa Barbara.

**Psilocarphus tenellus** Nutt. Near Santa Barbara, flowering in April.

**Senecio coronopus** Nutt. = *Senecio californicus* DC. Near Santa Barbara, flowering in May.

**Solidago californica** Nutt. Near Santa Barbara.

**Soliva daucifolia** Nutt. = *Soliva sessilis* Ruiz. & Pavon. On the dry grassy downs within the limits of Santa Barbara and in its immediate vicinity.

#### CICHORIACEAE.

**Cryptopleura californica** Nutt. = *Agoseris heterophylla* (Nutt.) Greene. Near Santa Barbara. This was the type of Nuttall's genus *Cryptopleura*.

**Hieracium argutum** Nutt.

**Leucoseris saxatilis** Nutt. = *Malacothrix saxatilis* (Nutt.) Torr. & Gr. On shelving rocks near the sea, flowering in April.

**Leucoseris tenuifolia** Nutt. = *Malacothrix tenuifolia* (Nutt.) Gray. On the mountains near Santa Barbara.

#### *Collected at San Pedro.*

#### CARDUACEAE.

**Grindella robusta** Nutt. Flowering in April.

**Hartmannia glomerata** Nutt. = *Deinandra fasciculata* (DC.) Greene. Common, flowering in April.

#### *Collected at San Diego.*

#### PORTULACACEAE.

**Calandrinia maritima** Nutt. On the seacoast, May.

#### ALSINACEAE.

**Loeflingia squarrosa** Nutt. Sandy plains.

**Polycarpon depressum** Nutt. On bare sand hills, near San Diego.

RANUNCULACEAE.

**Clematis lasiantha** Nutt. Near the seacoast.

**Clematis parviflora** Nutt. = *Clematis pauciflora* Nutt. Locality the same as the last. The *rv* in *parviflora* is a typographical error for *uc*, as indicated in the supplement of Torrey and Gray's *Flora* (p. 657), and the name used by subsequent authors has therefore been *C. pauciflora* Nutt.

BRASSICACEAE.

**Streptanthus heterophyllus** Nutt. Bushy hills near San Diego.

CRASSULACEAE.

**Echeveria lanceolata** Nutt. = *Cotyledon lanceolata* (Nutt.) Benth. & Hook.

**Echeveria pulverulenta** Nutt. = *Cotyledon pulverulenta* (Nutt.) Baker. Flowering in May.

**Sedum edule** Nutt. = *Cotyledon edulis* (Nutt.) Brewer. Edges of rocks and ravines.

CAPPARIDACEAE.

**Isomeris arborea** Nutt. This is the type of Nuttall's genus *Isomeris*.

VICIAEAE.

**Hosackia cytisoides rubescens** Torr. & Gr. *Hosackia cytisoides* Benth. is now referred to *Lotus benthami* Greene, but Nuttall's *Hosackia cytisoides rubescens* seems not to have been critically identified in recent years. Collected near San Diego.

**Lathyrus strictus** Nutt. = *Lathyrus vestitus* Nutt. Bushy places around San Diego.

**Lupinus truncatus** Nutt. This species was based on two specimens, one collected by Douglas at San Francisco, the other by Nuttall at San Diego.

RUTACEAE.

**Pitavia dumosa** Nutt. = *Oncoridium dumosum* (Nutt.) Hook. f.

RHAMNACEAE.

**Ceanothus verrucosus** Nutt. Low hills near the coast.

CACTACEAE.

**Cereus californicus** Torr. & Gr. = *Opuntia californica* (Torr. & Gr.). *Cereus californicus* Torr. & Gr. Fl. 1, 555, 1840. *Opuntia serpentina* Engelm. Am. Jour. Sci., ser. 2, 14, 338, 1852. The original description of this plant in Torrey and Gray's *Flora* is as follows: "Erect and shrubby, with numerous clusters of long and short spines; the branches somewhat

cylindric, repandly grooved, reticulated; flowers small, yellow; fruit dry and spiny. Arid hills and denuded tracts near St. Diego, California, common." Nuttall apparently preserved no specimen of the plant, and Torrey and Gray, having only this meager description as a guide, placed the species doubtfully in the genus *Cylindropuntia*. We now know that the two cylindrical-stemmed branching cactuses growing in the vicinity of San Diego are of the genus *Opuntia*, and that the yellow-flowered one is *Opuntia serpentina* Engelm. The earliest specific name of this plant being *californica*, it is here adopted.

**Echinocactus viridescens** Torr. & Gr. Arid hills near San Diego.

#### ONAGRACEAE.

**Oenothera bistorta** Nutt. = *Sphaerostigma bistorta* (Nutt.) Walp.

**Oenothera epilobioides** Nutt. = *Gnaphalium epilobioides* (Nutt.) Wats.

#### APIACEAE.

**Apiastrum angustifolium** Nutt. On this and the following species Nuttall based his genus *Apiastrum*. Both were collected at San Diego in April.

**Apiastrum angustifolium tenellum** Nutt. This, according to Dr. J. N. Rose, appears to be only a slender form of *A. angustifolium* Nutt., with which it was originally collected.

**Apiastrum latifolium** Nutt. See *Apiastrum angustifolium*, to which this plant is referred by recent authors.

**Deweya arguta** Torr. & Gr. = *Felton arguta* (Torr. & Gr.) Coult. & Rose. This species was the type of Torrey and Gray's genus *Deweya*.

**Euryptera lucida** Nutt. = *Pteridium euryptera* Gray. Nuttall's specific name is older than Gray's and should be adopted. This was the type species of Nuttall's genus *Euryptera*, and the type specimen was collected in April in the "woods of St. [San] Diego."

#### RUBIACEAE.

**Galium suffruticosum** Nutt. = *Galium nuttallii* Gray.

#### CAMPANULACEAE.

**Nemacladus ramosissimus** Nutt. In sandy soil near San Diego. This is the type species of Nuttall's genus *Nemacladus*.

#### CARDUACEAE.

**Aromia tenuifolia** Nutt. = *Amblyopappus pusillus* Hook. & Arn. Near the coast.

**Chaenactis tenuifolia** Nutt. Flowering in May.

**Franseria pumila** Nutt. = *Ambrosia pumila* (Nutt.) Gray. Near San Diego.

**Leptosyne californica** Nutt. = *Leptosyne douglasii* DC. Near San Diego, flowering in the beginning of May.

**Madaraglossa carnososa** Nutt. = *Blepharipappus carnosus* (Nutt.) Greene.

**Osmadenia tenella** Nutt. = *Culycadenia tenella* (Nutt.) Torr. & Gr. Flowering in May.

**Pentachaeta aurea** Nutt. On dry plains near the sea, in the vicinity of San Diego, flowering in April.

**Ptilomeris anthemoides** Nutt. = *Baeria anthemoides* (Nutt.) Gray. Near San Diego.

**Ptilomeris aristata** Nutt. = *Baeria aristata* (Nutt.). *Ptilomeris aristata* Nutt. Trans. Am. Phil. Soc., new ser., 7: 382, 1841. Dr. Gray in combining *Ptilomeris aristata* and *P. coronaria* adopted the specific name *coronaria*, but by the rule of precedence *aristata* must be used. Near San Diego, flowering in April.

**Ptilomeris coronaria** Nutt. = *Baeria aristata* (Nutt.) Coville. Near San Diego.

**Ptilomeris mutica** Nutt. = *Baeria mutica* (Nutt.) Gray. With the preceding.

**Tuckermannia maritima** Nutt. = *Leptosyne maritima* (Nutt.) Gray. On shelving rocks near the sea.

#### CICHORIACEAE.

**Malacomeris incanus** Nutt. = *Malacothrix incana* (Nutt.) Torr. & Gr. Collected on an island in the bay of San Diego. This species was the type of Nuttall's genus *Malacomeris*.

**Rafinesquia californica** Nutt. = *Nemoseris californica* (Nutt.) Greene. Near the seacoast in the vicinity of San Diego. This was the type of Nuttall's genus *Rafinesquia*.

**Sonchus fallax californicus** Nutt. = *Sonchus asper* L. presumably. It is not, however, cited by Gray in the Synoptical Flora. Collected around San Diego.

**Sonchus tenuifolius** Nutt. = *Sonchus tenuerrimus* L. In shady ravines about San Diego, among rocks.

**Uropappus grandiflorus** Nutt. = *Microseris linearifolia* (DC.) Gray. Collected by Nuttall at Santa Barbara also.

**Uropappus heterocarpus** Nutt. = *Microseris lindleyi* (DC.) Gray.



PROCEEDINGS  
OF THE  
BIOLOGICAL SOCIETY OF WASHINGTON

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THREE NEW BATS FROM THE ISLAND OF  
CURAÇAO.\*

BY GERRIT S. MILLER, JR.

Mr. Leon J. Guthrie, United States Weather Observer at Willemstad, Curaçao, West Indies, has obtained for the United States National Museum a small collection of bats preserved in formalin. Though representing only a fraction of the probable bat fauna of the island, the three species taken are of special interest, as all are new, while one is a member of a genus not hitherto detected outside of Mexico.

*Myotis nesopolus* sp. nov.

*Type* adult male (skin and skull from specimen in formalin) No. 101,849, United States National Museum, collected near Willemstad, Curaçao, West Indies, November 4, 1899.†

*Character*.—Similar to *Myotis nigricans* (Wied) from Colombia, but paler in color, and slightly smaller.

*Color*.—Dorsal surface intermediate between the raw umber and Prouts brown of Ridgway (Nomenclature of Colors, Pl. III, Nos. 11 and 14), the bases of the hairs just perceptibly darker. Ventral surface ochraceous buff, the basal half of the hairs slaty black.

*Skull*.—The skull exactly resembles that of *Myotis nigricans* from Santa Marta, Colombia and Chiapas, Mexico.

*Measurements*.—External measurements of type: total length, 70; tail vertebrae, 36; tibia, 15; foot, 5.6; forearm, 31; thumb, 4; longest finger,

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†"Caught by Mr. L. B. Smith in an attic in Punda." Collector's note.

55; ear from meatus, 11.6; ear from crown, 10; width of ear, 10; tragus, 6.8. Cranial measurements of type: greatest length, 13; basal length, 12; basilar length (median), 10; zygomatic breadth, 8; interorbital breadth, 3.2; mastoid breadth, 7; occipital depth, 5; mandible, 9; maxillary toothrow (exclusive of incisors), 5; mandibular toothrow (exclusive of incisors), 5.4.

*Specimens examined*.—One, the type.

*Remarks*. *Myotis neopolus* is readily distinguishable from *M. nigricans* by its much lighter color, especially on the underparts. Its color suggests that of dull specimens of *M. californicus* though the latter may always be recognized by the conspicuously bicolor fur of the back.

*Glossophaga elongata* sp. nov.

*Type* adult female (skin and skull from specimen in formalin) No. 101,871 United States National Museum, collected at Willemstad, Curaçao, West Indies, December 4, 1899.

*Characters*. In appearance similar to *Glossophaga longirostris* Miller\* from the Santa Marta Mountains, Colombia, but paler in color. Skull narrower and relatively much more elongate than that of the Columbian species. Incisors well developed, nearly double as large as in *G. soricina*,† the upper very strongly projecting forward.

*Ears*. The ears are moderately long, laid forward they extend about half way from eye to tip of muzzle. Anterior border of conch strongly convex at base, then very gently convex to rather broadly rounded tip. Posterior border straight to middle, then slightly and evenly convex to faint notch marking boundary of very narrow and rudimentary unthickened antitragus. The posterior border terminates slightly in front of anterior border and 6 mm. behind angle of mouth. Both surfaces of ear smooth, the inner, however, with six or seven small but distinct cross ridges near posterior border, and a few inconspicuous scattered hairs. Tragus upright, acutely pointed, sometimes deeply notched at tip. Anterior border perceptibly thickened, nearly straight, slightly convex above. Point acute. Posterior border irregularly convex, occasionally so narrowly and deeply notched above that the tip appears bifid. Opposite anterior base there is a broad shallow notch, and below this the posterior border is more abruptly convex to base.

*Nose and chin*. Lower, oval, portion of noseleaf small and very indistinctly outlined, but not peculiar in form. Terminal, erect, portion well developed, its width nearly equal to outer border. Tip rather bluntly rounded. Outer border slightly concave. Chin divided by a rather broad and shallow V-shaped groove, the edges of which are irregularly tuberculate.

*Membranes*. The membranes are ample and somewhat thin, their surfaces rough. Width of uropatagium equal to length of tibia. Pro-

\*Proc. Acad. Nat. Sci., Philadelphia, 1898, p. 330.

†In the type and only known specimen of *G. longirostris* the incisors are absent and their alveoli nearly resorbed.



patagium including metacarpal of thumb. The membranes are practically naked throughout.

*Feet*.—The foot is long and strong, about two thirds length of tibia. Toes essentially equal in length and distinctly longer than metatarsals. Claws large, nearly one half as long as rest of foot. Calcar distinct, 5 mm. in length, its extreme tip projecting beyond membrane.

*Tail*.—The tail is very short, about equal to calcar, its tip forming a minute projection on upper side of membrane.\*

*Fur and color*.—The fur is very soft, but rather loose in texture. Length at middle of back about 5 mm. It is closely confined to body, reaching membranes in a very narrow line only. On humerus it extends about to middle both above and below. That of head covers basal third of outer surface of ears.

Color of dorsal surface hair brown irregularly lightened by appearance at surface of the pale drab which occupies the basal two thirds of the fur. This drab is paler than the ecru drab of Ridgway, but is distinctly tinged with yellowish brown. Underparts pale Isabella color, fading to ecru drab on flanks and washed with hair brown on chin, throat and chest, the hairs everywhere pale drab at base. Ears, feet and membranes dark brown.

*Skull*.—The skull of *Glossophaga elongata* is narrower and more elongate than that of *G. longirostris* and the braincase is smaller and less elevated above the faceline. The braincase rises above dorsal surface of rostrum at an angle of about 20° in *G. elongata* and *G. soricina*, but of scarcely 12° in *G. longirostris*. Rostrum slightly longer than in *G. longirostris*, and distinctly shallower when viewed from the side, its dorsal surface much more flattened, especially between orbits. Anterior nares narrower and more elongate. Rudimentary vertical process of zygoma as in *G. longirostris* and smaller than in *G. soricina*. Bony palate behind plain of last molar even narrower than in *G. longirostris*. Base of braincase as in *G. longirostris*, though the auditory bullae are slightly smaller.

*Teeth*.—The teeth are as in *Glossophaga longirostris*, except that the incisors, absent in the Colombian species, are well developed, and relatively larger than in *G. soricina*. The upper incisors project so nearly horizontally that when skull is viewed from directly above the entire anterior face is visible.

*Measurements*.—External measurements of type: total length, 65; tail vertebra, 5; tibia, 15.8; foot, 11.4; calcar, 5.4; forearm, 40; thumb, 10; longest finger, 7.8; ear from meatus, 14.6; ear from crown, 9.6; width of ear, 11; height of noseleaf above edge of lip, 5.4; height of noseleaf behind, 3; greatest width of noseleaf, 4.

Cranial measurements of type: greatest length, 24.4; basal length, 22.2; basilar length, 20.4; zygomatic breadth, 9.8; interorbital breadth

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\*In the original description of *Glossophaga longirostris* the tail is stated, on the authority of the collector (no trace of it can be seen in the dry specimen) to be 18 mm. in length. This measurement without doubt refers to width of uropatagium.

(behind prominences), 5; mastoid breadth, 9.6; breadth of braincase above roots of zygomata, 9; depth of rostrum between orbits, 3; mandible, 16.2; upper tooththrow (exclusive of incisors), 8.8; lower tooththrow (exclusive of incisors), 9.

*Remarks.*—*Glossophaga elongata* differs conspicuously from *G. longirostris* in its paler color, particularly on the ventral surface. The cranial characters are equally distinctive. In one specimen (No. 101,855) the third upper molar is absent on both sides.

*Leptonycteris curasoë* sp. nov.

*Type* adult male (in alcohol) No. 101,851 United States National Museum, collected at Curaçao, West Indies.

*Characters.*—Closely related to the Mexican *Leptonycteris nivalis* (Sausure) but color darker, and interfemoral membrane narrower and less hairy. *Upper incisors equally spaced* and more projecting than in the Mexican species. Second lower premolar slightly but distinctly crescentic.

*Ears.*—The ears are broad and short, laid forward they extend to anterior canthus of eye. Anterior border of conch nearly straight and almost horizontal through proximal 5 mm., then very abruptly convex. Beyond this convexity it is again straight for about 5 mm. below rather narrowly rounded tip. The two straight areas are nearly perpendicular to each other. Posterior border slightly concave below tip, then moderately convex to faintly marked notch at upper edge of antitragus. Antitragus small and ill defined, its substance distinctly thickened. The slightly concave anterior border terminates abruptly a little in advance of anterior base of ear, and 7 mm. behind angle of mouth. Outer surface of ear smooth and naked except at extreme base, where it is covered with fur similar to that of head. Inner surface slightly papillose and sprinkled with inconspicuous hairs. Four or five very indistinct cross ridges on inner surface of conch near middle of posterior border. Tragus upright, much thickened along anterior border. Anterior border straight to slight subterminal concavity. Point blunt. Posterior border irregular, but without distinct projections. Through anterior base the width of tragus is equal to one half anterior border.

*Muzzle and chin.*—Noseleaf diamond shaped, the lower portion bounded by the oblique nostrils, the upper and slightly larger portion erect and free. Lips below and at sides of nostrils tumid, this swollen area extending back on each side immediately behind noseleaf nearly to median line and separated posteriorly from noseleaf by a distinct, broadly V-shaped groove.

Chin divided by a deep groove, narrow below, wide above, its edges irregularly tuberculate.

*Membranes.*—The membranes are thick rough and leathery; the wings and propatagium broad and ample; the uropatagium greatly reduced (only 4 mm. wide at middle). Propatagium extending as a broad fold along forearm to include metacarpal of thumb. The membranes are essentially naked.

*Feet*.—The feet are large and strong, about two thirds length of tibia. Toes essentially equal in length, slightly longer than metacarpals, armed with large strong claws, the latter equal to about one third of rest of foot. Calcar distinct, 6 mm. in length.

*Fur and color*.—The fur is short, dense and velvety, that on middle of back about 4 mm. in length. It is closely confined to body, reaching membranes in a very narrow line only. On humerus it extends over proximal half both above and below. Dorsal surface of forearm densely but inconspicuously furred. Under surface of forearm and of propatagium and both sides of uropatagium scantily haired.

Color after three months immersion in formalin hair brown with a faint bluish cast, slightly paler on ventral surface, the hairs everywhere ecru drab at base. Ears and membranes dark brown.

*Skull*.—The skull is slightly larger than that of *Leptonycteris nivalis*, and the rostrum is a little deeper, but otherwise I can detect no cranial characters to separate the two species.

*Teeth*.—Upper incisors large and evenly spaced, not in two pairs separated by a distinct median gap as in *L. nivalis*. These teeth project so strongly forward that the entire anterior face is visible when skull is viewed directly from above. Maxillary teeth essentially as in *L. nivalis*. Lower incisors larger than in *L. nivalis* the lateral pairs less widely separated. Second lower premolar distinctly crescentic when viewed from its apex, the concavity directed inward. In *L. nivalis* this tooth is straight. Mandibular molars not peculiar.

*Measurements*.—External measurements of type: head and body, 70 (75)\*; tibia, 20 (22); foot, 15 (14.6); foot without claws, 12.8 (12); calcar, 6 (6); forearm, 53 (55); thumb, 10 (11); longest finger, 96 (98); ear from meatus, 15.6 (16); ear from crown, 11.6 (12.8); width of ear, 12 (11); tragus, 6 (6.2); height of noseleaf posteriorly, 3 (3); greatest width of noseleaf, 3.4 (4).

Cranial measurements of type: greatest length, 26 (27); basal length, 25 (25.6); basilar length, 22.4 (23.6); zygomatic breadth, 11 (11); interorbital breadth, 5 (5); mastoid breadth, 10.6 (10.8); breadth of braincase above roots of zygomata, 10 (10); greatest depth of braincase, 8 (8); depth of rostrum between orbits, 3.2 (4); mandible, 17.4 (17.4); upper tooththrow (exclusive of incisors), 9 (8.6); lower tooththrow (exclusive of incisors), 9.9 (9).

*Remarks*.—The most prominent character of this species is the regular spacing of the upper incisors. The color is darker than that of the Mexican animal, in which the peculiar bluish cast is quite absent. In *L. nivalis* the legs and interfemoral membrane are noticeably sprinkled with hairs 5 mm. in length which produce a distinctly shaggy appearance. These hairs are reduced to an inconspicuous pubescence in *L. curacaoe*.

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\*Measurements in parenthesis are those of an adult male *Leptonycteris nivalis* from Colima, Mexico.



PROCEEDINGS  
OF THE  
BIOLOGICAL SOCIETY OF WASHINGTON

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EIGHT NEW SPECIES OF NORTH AMERICAN  
PLANTS.\*

BY CHARLES LOUIS POLLARD.

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*Lupinus psoraleoides* n. sp.

Perennial, 1-1½ dm. high, subacaulescent, with a multicapital caudex and slender woody root: whole plant densely villous with long white hairs: leaves long-petioled, the blades 5-7-foliolate: leaflets oblanceolate, somewhat acute at the apex, 2-3 cm. long: spike very densely flowered, almost sessile, scarcely surpassing the foliage: flowers violet purple, 1 cm. long, subtended by narrowly linear scarious bracts: calyx one-half the length of the corolla, markedly bilabiate, the teeth acute; standard suberect, shorter than the keel: legume oblong, 1½ cm. long, tipped with the slender persistent style: seeds few, apparently nearly orbicular.

Type in the U. S. National Herbarium, No. 201,582, collected in open gravelly soil at Gunnison, Colorado, by Elam Bartholomew, August 30, 1899 (No. 2680). In aspect the plant suggests certain species of *Psoralea*; its marked peculiarities are the slender nearly sessile spike, the small standard and the long villous pubescence.

*Viola amorphophylla* n. sp.

Plant acaulescent, about 1 dm. high, from a stout, vertical rootstock, absolutely glabrous throughout and semisucculent: blades of the leaves elliptical or oblong-elliptical, the margins entire or sometimes obscurely crenate near the very obtuse apex, rarely with a small lobe or incision near the rounded or slightly tapering base: petioles narrowly margined, equalling the blades or shorter: stipules scarious, elongated-linear: scapes surpassing the foliage: flower purple, about 2½ cm. broad: sepals

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ovate-lanceolate, acute, auriculate at base; petals oblong, bearded, the spur short and blunt; capsule prismatic, one-third longer than the calyx; apetalous flowers borne on evidently erect scapes.

Type in the U. S. National Herbarium, No. 209,214, collected at Tryon, North Carolina, May 5, 1897, and communicated by Mr. C. D. Beadle, Curator of the Biltmore Herbarium. A violet with very peculiar and anomalous foliage, showing affinities to the *Sagittatae*, but distinguished from all the species of that group by its oddly shaped leaves, large flowers and broad sepals.

*Viola pruinosa*. n. sp.

Plant low (about 1 dm. high), sending up numerous branching stems from a very short and thick rootstock; leaves slender-petioled, pinnately decomposed, the ultimate divisions oblong-linear, 5-7 mm. long; under surface of the dull green foliage densely clothed with short and stiff, white, pruinose pubescence, so that the plant appears glaucous; petioles, especially those of the basal leaves, with broadly sheathing scarious margins; flowers solitary in the axils, borne on slender peduncles, rather small (1-1½ cm. broad); sepals linear, very short; petals narrowly oblong, beardless, bright yellow with purple veinings, the two uppermost petals often entirely overcast with purple; spur wanting; capsule not observed.

Type in the U. S. National Herbarium, No. 342,196, collected by John B. Leiberg in Bear Valley, California, at an altitude of 2200 meters, April 17, 1898 (No. 3307). Related to *V. Douglasii*, but at once distinguishable on account of the small flowers and the peculiar frosted appearance of the foliage.

*Gentiana citrina* n. sp.

Annual; stem simple, strict, 2-4 dm. high; leaves about six pairs, oblong or ovate-oblong, sessile or slightly clasping; inflorescence narrowly paniculate, the branches 1-5-flowered, each cluster subtended by a pair of foliaceous bracts; flower 1½-2 cm. long, yellow; calyx campanulate, the ovate-lanceolate, somewhat unequal lobes longer than its tube; corolla tubular-campanulate, with 4 or rarely 5 erect ovate lobes, one-fourth the length of the tube, quite destitute of sinus-appendages; throat crowned with a copious fringe of setae; capsule sessile.

Type in U. S. National Herbarium, No. 22,087, collected by C. G. Pringle in the valley of Toluca, State of Mexico, August 18, 1892 (No. 4196) and distributed as *G. Wrightii* A. Gray, from which it differs in certain important particulars. In his description of *Wrightii* Dr. Gray emphasizes the fact that the leaves nearly equal the internodes; the calyx lobes are said to have scabrous margins and the corolla is campanulate-funnel-form with lobes fully one-third the length of the tube. I have also examined the type of *G. Wrightii*, which was collected in southern Arizona, and find little in common between the two species except the characters of the subgenus to which both belong. Mr. Pringle's No. 4237, also from Toluca, collected at an altitude of 11,000 feet, is evidently a depauperate alpine form of *G. citrina*.

*Gentiana connectens* n. sp.

Stem slender, rather lax, 4-6 dm. high, with scattered branches; leaves oblanceolate, the uppermost smaller, linear-lanceolate; flowers 1-3 at the ends of the branches, borne on slender filiform pedicels of twice or even thrice their length; calyx narrowly campanulate, 1 cm. long, its tube very short, its lobes linear-acuminate; corolla twice the length of the calyx, violet-purple, with 5 erect ovate-lanceolate lobes destitute of sinus-plaits; throat crowned with numerous filiform setae; anthers versatile; ovary markedly stipitate; stigmas 2, coherent at base; capsule with numerous oblong brown seeds.

Type in U. S. National Herbarium, No. 22,045, collected by Thomas Bridges in California (No. 166a). No more specific locality than this appears on any of Bridges' labels. The name assigned to this gentian refers to the fact that it combines certain characters of the two main subgeneric groups; thus it possesses the crown of setae, stipitate ovary and absence of corolla-glands indicative of *Gentianella*; but the lobes of the corolla are five in number, as in *Pneumonanthe*, which it also suggests in habit.

*Gentiana decora* n. sp.

Stem simple, or with one or two short branches above, 3 dm. or more high, sparsely and minutely puberulent; leaves lanceolate or the lower oblanceolate, tapering to base and apex, slightly petioled, the margins not ciliate; flowers sessile, in a terminal bracted cluster of five or more, a few often scattered in the upper axils; calyx-tube cylindrical, puberulent, 8-10 mm. long, more than twice the length of the widely separated narrowly linear and ciliate-margined lobes; corolla campanulate-funnel-form, 2-3 cm. long, bright blue with darker stripes, within paler and the stripes more conspicuous; lobes of the corolla ovate, slightly mucronate, scarcely twice the length of the unequally bidentate sinus-appendages; seeds and other floral characters as in *G. Elliottii*.

Type in the herbarium of Columbia University, collected by Mr. A. M. Huger near Waynesville, N. C., September and October, 1896. Specimens of this and other southern gentians were very kindly sent to me for determination by Dr. John K. Small. The species is very nearly related to *G. Elliottii*, but differs in the more acute corolla-lobes, the absence of fimbriation on the sinus-plaits of the corolla, and the short, narrow calyx-lobes.

*Chrysopsis latisquamea* n. sp.

Perennial by offshoots, erect, 4-5 dm. high, the foliage and lower portion of the stem clothed with a loose white arachnoid tomentum; basal leaves rosulate, oblanceolate or spatulate, obtuse, the margins entire; stem leaves sessile, linear or linear-oblong, the upper becoming small and bract-like; inflorescence cymose, the branches glandular-pubescent, each terminated by a single large head 1½ cm. high; involucre broadly

campanulate; bracts ovate-lanceolate, more or less herbaceous, glandular, the innermost longest; rays bright yellow, linear, 1 cm. long; pappus copious, yellowish-white, the outer series of bristles very short and capillary, the inner minutely setulose; achene 2 mm. long, fusiform, slightly compressed, villous, with 8-10 salient longitudinal ribs; receptacle strongly alveolate.

Type in U. S. National Herbarium, collected by Miss Marie Meislahn at Clarcona, Florida, (No. 150), and communicated by Mr. A. J. Pieters, who has kindly placed in my hands for determination a large collection of Florida plants. This *Chrysopsis* differs from *C. pilosa* (Walt.) Britton (*C. gonypina* Nutt.) to which it is most nearly related, by the broad involucrel bracts and many-ribbed achenes. Its involucre is so strikingly peculiar for this genus that were it not for the similarity of other structural characters the plant might be considered a distinct generic type.

*Solidago Maxoni* n. sp.

Slender, erect, 4-1 m. high, the stem striate-grooved and glandular-pubescent, particularly above; leaves 5-7 cm. in length, thin, 1-nerved, slightly glandular-pubescent above, pale and glabrous beneath, the margins entire or exhibiting an occasional serration, lanceolate in outline, acute or acuminate at apex, tapering at base to a short margined petiole; lowermost leaves similar in shape, but slender-petioled; uppermost smaller and linear-lanceolate; inflorescence thyrsoid-paniculate, elongated, 2-3 dm. long, the branches numerous, each bearing from 3 to 12 slender-pedicelled heads, the pedicels and branchlets densely strigose-pubescent; heads small (5-7 mm. high) the involucre campanulate, with numerous loosely imbricated herbaceous or somewhat scarious obtuse and ciliate-margined bracts; rays about one-half the length of the inner bracts; achene linear, laterally compressed, glabrous.

Type in the U. S. National Herbarium, No. 357,100, collected on Bald Knob, Salt Pond Mountain, Virginia, by Charles L. Pollard and William R. Maxon, August 25, 1899 (No. 71). This *Solidago* is related to *S. monticola*, of which typical specimens were secured from the same region. The marked glandular pubescence, nearly entire leaves and different type of inflorescence are characters which have warranted its separation. I have taken pleasure in naming it for my companion and associate, Mr. Maxon.



PROCEEDINGS  
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SOME NEW OR NOTEWORTHY LOUISIANA  
PLANTS.\*

BY CHARLES LOUIS POLLARD AND CARLETON R. BALL.

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The species described below were collected by Mr. Ball in the vicinity of Alexandria, Louisiana, during the summer of 1899. A report on the entire collection is in preparation by Mr. Ball, who has kindly afforded me an opportunity of examining with him the more interesting portions of his material.

C. L. P.

*Baptisia Texana* (Holzinger), n. comb.

*Baptisia lanceolata texana* Holzinger, Contr. U. S. Nat. Herb. 1:286. Oct. 31, 1893.

Plant erect, 5-6 dm. high, the stems freely branching, pubescent; leaves subcoriaceous, nearly sessile, mostly shorter than the internodes; leaflets oblong or obovate, very obtuse at apex, cuneate at base, slightly petiolulate, 3-4 cm. long, both surfaces strongly reticulate veined and sprinkled with scattered hairs; flowers solitary in the upper axils, and also forming short terminal racemes, yellow, 2 cm. long; calyx hirsute, with 5 short teeth; corolla resembling that of *B. lanceolata*; legume ovoid, stipitate, villous, 1-1½ cm. long, tipped with the elongated persistent style; seeds few, ovoid, 3-4 mm. long.

Mr. Holzinger based his variety on Nealley's No. 73, from Texas, the type being in the U. S. National Herbarium. In the course of his description he remarks "The pubescence, including the ovary, the sessile leaves, and the nearly sessile solitary flowers in the axils of the upper leaves of the flowering branches, which are terminated by few-flowered

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racemes, associate this plant closely with *Baptisia lanceolata*". A very superficial examination of the characters involved would have convinced Mr. Holzinger that he was in error, even if he had chosen to regard the principles of geographic distribution as of no consequence. *Baptisia lanceolata* is a plant of the southeastern Atlantic coast from South Carolina to Florida, and is not known from the Gulf states. Its leaves are by no means sessile, but distinctly petiolate, the petioles in many cases a centimeter or more in length, while the leaflets, instead of being short and obovate as in *B. Texana*, are elongated, and unmistakably lanceolate in outline. The stems, moreover are glabrous in *lanceolata*. The nearest ally of *B. Texana* is probably *B. lucicaulis*, a species which is glabrous throughout, however, even to the pod. Excellent fruiting specimens were obtained by Mr. Ball near Alexandria, La., June 3, 1899 (No. 546), growing on hillsides under scrub oaks.

***Stylosanthes biflora hispidissima* (Michx.), n. comb.**

*Stylosanthes hispida* var. *b. hispidissima* Michx., Fl. Bor. Am. 1:75, 1893.

This form differs from the type in the long hirsute pubescence with which the stem and often the foliage is clothed. Michaux's characterization of the variety as "universe hispidissima" leaves little doubt as to its identity. The plant is more prostrate in habit and diffusely branched than the ordinary form of *S. biflora*. Mr. Ball's specimens were collected at Alexandria, La., June 10, 1899 (No. 621).

***Prunella vulgaris scaberrima* n. var.**

Stems purple; herbage and inflorescence densely hispid and scabrous-pubescent with white hairs; otherwise similar to *P. vulgaris*.

Type in U. S. National Herbarium, collected by Mr. Ball at Alexandria, La., June 9, 1899 (No. 607). The plant is there common in dry soil.

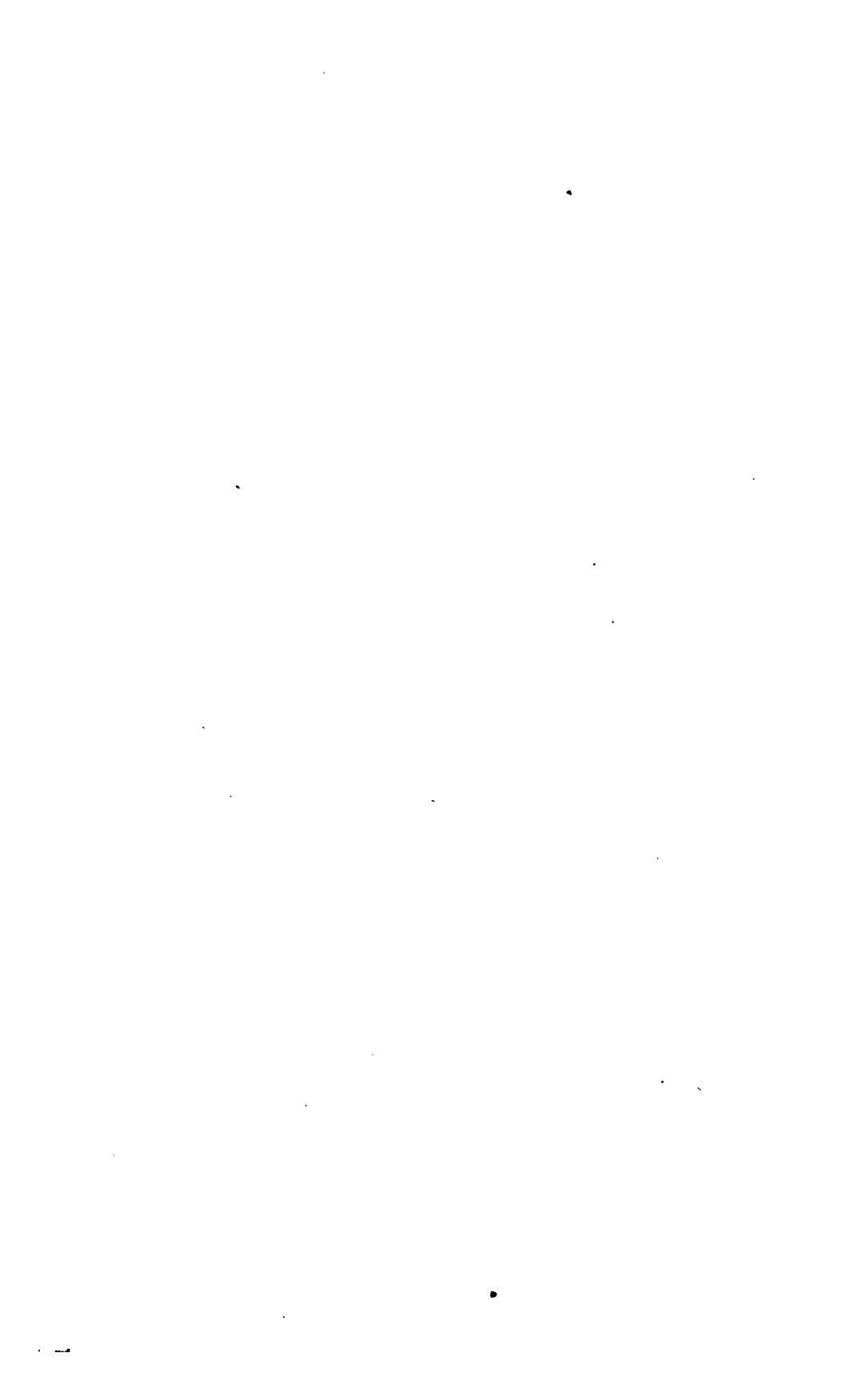
***Physalis rigida* n. sp.**

Perennial, from a thick root; stems tufted, erect, rigid, sulcate, more or less branching, 3-3½ dm. high, hispid-pubescent with flat hairs, particularly above; leaves firm, ovate-lanceolate, obscurely repand-dentate, acute at apex, tapering to base, densely pubescent when young, scabrous above when mature, 4-6 cm. wide; petioles slender, 1½-4 cm. long; flowers small, 1-1½ cm. broad, on slender hispid-pubescent pedicels; flowering calyx densely pubescent, its lobes ovate-triangular, acute; limb of corolla yellow, the throat dark purple; fruiting calyx nearly smooth, ovoid, obscurely 10-ribbed, 2½-3 cm. long, truncate or somewhat depressed at base; pedicel reflexed, hispid-pubescent, about 2 cm. long.

Type in the U. S. National Herbarium, collected at Alexandria, La., on a dry railroad embankment May 23, 1899 by Mr. Ball (No. 431). No. 435, a fruiting specimen, is to be referred here. The plants were sub-

mitted to Dr. P. A. Rydberg for determination, who writes as follows concerning them:

"The two specimens of *Physalis* sent me belong to an undescribed species. It is nearest related to *P. virginiana intermedia* Rydberg. \* \* The new species differs from *intermedia* in the thicker and broader leaves, the fruiting calyx, which is angled and more rounded at the base, and in the lack of viscid pubescence. It may also be compared with *P. longifolia*, but has much shorter and broader leaves and is more puberulent. I would be glad to have you describe it as I have very little time and pay no attention to any other botany at present except the flora of the Rocky Mountain region."



PROCEEDINGS  
OF THE  
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SEVEN NEW RATS COLLECTED BY DR. W. L.  
ABBOTT IN SIAM.\*

BY GERRIT S. MILLER, JR.

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Among the mammals collected by Dr. W. L. Abbott during a second expedition to Siam, and presented to the United States National Museum are seven large and medium sized species of *Mus*, all of which appear to be new. They were secured in the mountains of Trong, a small state subject to Siam and situated on the west side of the Malay Peninsula about 500 miles north of Singapore.

KEY TO THE RATS OF TRONG.†

Hind foot about 50 mm.; skull about 55 mm.

Tail much longer than head and body; back and sides strongly ochraceous. .... *Mus vociferans*.

Tail about equal to head and body; back and sides not ochraceous.

Fur composed almost exclusively of fine, grooved bristles; ear longer than broad; general color above iron gray, beneath dull white. .... *Mus ferreocanus*.

Fur composed almost exclusively of coarse hairs, with a very few slender grooved bristles intermixed; ear as broad as long; general color grizzled brown above, pale buff below. .... *Mus validus*.

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†Exclusive of *Mus alexandrinus*.'

Hind foot less than 40 mm.; skull less than 45 mm.

Tail much longer than head and body, dark brown throughout.....*Mus cremoricenter*.

Tail about equal to head and body, bicolor.

Tail slightly shorter than head and body; hind foot less than 30 mm.; fur of belly dusky at base.....*Mus asper*.

Tail equal to or slightly longer than head and body; hind foot more than 30 mm.; fur of belly not dusky at base.

Nasals extending conspicuously behind nasal branches of premaxillaries; white of belly broadly continuous over lower leg with that of foot; general color dull ochraceous.....*Mus pellax*.

Nasals not extending behind nasal branches of premaxillaries; white of belly usually separated from that of foot by tawny inner surface of lower leg; general color bright ochraceous.....*Mus surifer*.

***Mus vociferans* sp. nov.**

*Type* adult male (skin and skull) No. 86,736 United States National Museum, collected in the mountains of Trong, Lower Siam, at about 1000 ft. altitude, February 21, 1899.

*Characters*.—Similar to *Mus sabanus* Thomas of Borneo, but general size slightly greater and color apparently paler and brighter. Antorbital foramen less constricted below than in *M. sabanus* and with much wider outer wall. Region about posterior extremity of nasals less elevated. Molars relatively larger than in *Mus sabanus*.

*Fur*.—The fur is composed of three elements: (a) fine, somewhat wooly underfur, plumbeous on the back, white on the belly, (b) coarse terete hairs, and (c) grooved hairs or slender bristles. These all pass by in sensible gradations from one kind to another. On back the hairs and bristles are about 15 mm. in length. Those of rump are not elongated. On belly they are much shorter, scarcely exceeding 6 mm. Inner surface of legs free from bristles.

*Color*.—Back and sides ochraceous, everywhere sprinkled with black. The ground color is brightest on back and rump where it approaches orange ochraceous, and dullest on sides where it is very nearly raw sienna. The black is most conspicuous over lumbar region where it is somewhat in excess of the ochraceous. Further forward the two colors are about equally mixed. On sides the black is very inconspicuous. Top of head like back, but colors more finely mingled. Cheeks orange buff, very slightly sprinkled with buff posteriorly. Muzzle dull hair brown. Whiskers black. Belly and inner side of legs dull yellowish white to base of hairs; elsewhere the underfur is slate gray. Feet white, irregularly clouded with hair brown. Tail bicolor at base (dark brown above, whitish below) whitish throughout beyond middle.

*Tail*.—The long slender tail of *Mus vociferans* is coarsely, conspicuous-

ly, and uniformly annulated. At middle there are only seven or eight rings to the centimeter. The rings are irregularly and inconspicuously marked by cross furrows dividing them into sharply rectangular scales longer than broad. Numerous stiff hairs spring from beneath the free edges of the rings, usually three to each scale. In length they scarcely exceed width of the rings, except near tip where they become longer and less stiff.

*Skull*.—The skull of *Mus vociferans* (Pls. III and IV, Fig. 3) is large, but in proportion to its size not very heavily built. In general appearance it differs only slightly from that of *M. sabanus*. On comparison it is seen to differ from that of the Bornean species in less robust rostrum, less elevated frontal region between roots of zygomata, and in the form of the antorbital foramen. This is smaller and more contracted, especially below, and the maxillary plate forming the outer wall is wider and less concave. The front edge of this plate is nearly straight, though slightly convex above. The audital bullæ like those of *Mus sabanus* are relatively very small, scarcely more than half as large as in *Mus decumanus*. By this character alone the species may be distinguished from the other large rats of the Malay Peninsula.

*Teeth*.—The teeth appear to agree in all respects with those of *Mus sabanus*, though I have seen none of the latter unworn. The enamel pattern is like that of *M. decumanus* except that there is no trace of rudimentary anterior outer tubercle often present in the second upper molar of the house rat. As in this species the posterior upper molar consists of an anterior inner tubercle followed by a crescentic loop with concavity directed inward. In unworn teeth this loop is normally complete, though in some specimens the posterior limb is divided by a furrow. With abrasion the limbs of the crest become separated. Front surface of incisors deep orange.

*Measurements*.—External measurements of type: total length, 611; head and body, 229; tail vertebrae, 382; hind foot, 45 (43)\*; ear from meatus, 24; ear from crown, 19; width of ear, 18. Seven specimens (including type): total length, 566 (545-611); head and body, 224 (216-229); tail vertebrae, 342 (323-380); hind foot, 45 (42-48); hind foot without claw, 43 (40-46).

Cranial measurements of type: greatest length, 56; basal length, 47.6; basilar length, 44.6; palatal length, 25; least width of palate between anterior molars, 5; diastema, 14.8; length of incisive foramen, 8; combined breadth of incisive foramina, 3.8; length of nasals, 21.4; combined breadth of nasals, 6.2; zygomatic breadth, 25.8; interorbital breadth, 9; breadth of braincase above roots of zygomata, 20.4; mastoid breadth, 18.8; occipital depth at front of basioccipital, 14; frontopalatal depth at posterior extremity of nasals, 13.6; least depth of rostrum immediately behind incisors, 11; maxillary toothrow (alveoli), 11.8; width of front upper molar, 3; mandible, 30.6; mandibular toothrow (alveoli), 10.

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\*Measurement of hind foot in parenthesis is taken exclusive of claws.

*Specimens examined*.—Eight, all taken at or near the type locality.

*Remarks*.—*Mus vociferans* is the mainland representative of *M. sabanus*, a rat quite unlike any of the other species known to occur on the Malay Peninsula, and at present recorded from Borneo and the Natuna Islands only. It is a very noisy animal; when trapped its loud cries so quickly attract the smaller carnivores that perfect specimens are with difficulty obtained.

*Mus ferreocanus* sp. nov.

*Type* adult female (skin and skull) No. 86,737 United States National Museum, collected in the mountains of Trong, Lower Siam, at about 3000 ft. altitude, January 15, 1899.

*Characters*.—Size large (hind foot about 56; greatest length of skull, 53) tail slightly longer than head and body, dark brown at base, whitish at tip; ear long and narrow, its length greater than distance from eye to nostril; fur composed almost exclusively of fine grooved bristles; general color above bluish iron gray, beneath pure white; skull with slightly developed supraorbital ridges.

*Fur*.—Underfur rather scant, not at all woolly except on belly. The main body of the fur is composed of fine grooved bristles, those on middle of back about 15 mm. in length. Interspersed with the bristles are a few terete black hairs, 25-30 mm. in length. These are practically confined to the back and rump, and are nowhere conspicuous.

*Color*.—The color of this rat is difficult to describe with accuracy, as the tints cannot be matched in Ridgway's Manual of Colors. The general effect is a lustrous bluish iron gray, darker along middle of back, paler and slightly drab-tinged on sides; everywhere frosted by the pale glistening tips of the bristles, which produce a sheen varying much with different exposures to light. Cheeks washed with drab gray, muzzle with seal brown. Underparts creamy white, this color extending down inner side of front legs to wrists, and on hind legs nearly to ankles. Fur of dorsal surface gray (Ridgway, Pl. II, No. 8) at base, that of underparts white throughout. Ear dark brown; a small tuft of fine white hairs immediately beneath orifice. Tail dark brown, the terminal fourth dull white. Hind feet uniform sepia. Front feet sepia varied with dull white.

*Tail*.—The moderately long tail of this species is finely, inconspicuously and somewhat irregularly annulated. At middle there are twelve rings to the centimeter. The rings are divided by cross furrows into scales longer than broad and with rounded corners. These scales, however, are scarcely noticeable to the unaided eye. The fine stiff hairs that spring from the spaces between the rings are in length about one half greater than width of ring, and are apparently not definitely arranged with regard to the scales. Near tip of tail the rings become narrower and more indefinite and the hairs longer and less stiff, though without forming any semblance of a pencil.



*Skull*.—The skull of *Mus ferreocanus* (Pls. III and IV, Fig. 2) though of the same general size as that of the other large rats of Trong, is easily recognizable by its shallow, weak rostrum and tapering form as well as by various details in structure. The zygomata are strongly convergent anteriorly, their anterior roots relatively light and little spreading. Antiorbital foramina small, but less contracted below than in the other species. The plate forming its outer wall is faintly concave on the outer surface, its anterior border slightly convex from below middle, the straight portion at base *sloping distinctly backward*. Pterygoids long and straight to the extreme tip, the interpterygoid space *narrowing gradually and continuously* from behind forward. Audital bullæ much larger than in *Mus vociferans*, but not peculiar in form. Interorbital region narrow. Supraorbital ridges low and little developed, much as in *Mus bowersi*, but traceable along sides of braincase to lambdoid ridge.

*Teeth*.—Molars slightly narrower than in *Mus vociferans*, the enamel folds relatively broader, but not essentially different in form. The posterior limb of the terminal crescent in the third upper molar is normally divided from the anterior, even in unworn teeth. Lower molars differing in much the same manner as the upper. Incisors relatively weak, their anterior face *yellowish white*.

*Measurements*.—External measurements of type specimen: total length, 489; head and body, 238; tail vertebræ, 251; hind foot, 56 (53); ear from meatus, 27; ear from crown, 21; width of ear, 17. A second adult specimen: total length, 501; head and body, 241; tail vertebræ, 260; hind foot, 56 (53).

Cranial measurements of type: greatest length, 53.6; basal length 48; basilar length, 45; palatal length, 25; least width of palate between anterior molars, 5; diastema, 15.8; length of incisive foramen, 9.4; combined breadth of incisive foramina, 3.8; length of nasals, 22.6; combined breadth of nasals, 5.2; zygomatic breadth, 25.4; interorbital breadth, 8; mastoid breadth, 20.2; breadth of braincase above roots of zygomata, 20; depth of braincase at anterior extremity of basioccipital, 14.6; frontopalatal depth at posterior extremity of nasals, 12; least depth of rostrum immediately behind incisors, 8; maxillary toothrow (alveoli), 9.4; width of front upper molar, 2.8; mandible, 30; mandibular toothrow (alveoli), 9.

*Specimens examined*.—Three, all from the type locality.

*Remarks*.—This species is not closely related to the other rats of the Malay Peninsula; and I am unable to find any description of an animal at all resembling it among the forms occurring in the East Indian Archipelago.

*Mus validus* sp. nov.

*Type* adult male (skin and skull) No. 86,741 United States National Museum, collected in the mountains of Trong, Lower Siam, at about 1000 ft. altitude, February 18, 1899.

*Characters*.—A large robust animal in size and general appearance resembling *Mus bowersi* Anderson from Burmah. Fur coarse, but essen-

tially spineless. Tail about as long as head and body, dark brown throughout, its annulation more coarse than in *M. bowersi*. Ear short and broad, its length less than distance from eye to nostril. Skull and teeth much heavier than in the Burmese species, the rostrum shorter, broader and deeper, and supraorbital ridges remarkably heavy. *Enamel pattern of third upper molar essentially like that of second, and both with well developed antero-external tubercle.*

*Fur*.—Although the fur is composed of the usual three kinds of hair the bristles are so slender that to the unaided eye their true nature is not apparent. They average about 30 mm. in length on the back, while the terete hairs are little more than half as long.

*Color*.—Back and sides a fine grizzle of black and dull buff (slightly browner than Ridgway, Pl. V, No. 13), the two colors nearly equally mixed on back, but the black hairs much less abundant on sides, where the buff is somewhat dulled by the irregular appearance at the surface of the gray (Ridgway, Pl. II, No. 7) underfur. Underparts cream buff to base of hairs, this color extending down inner surface of legs to wrists and nearly to ankles. Feet scantily clothed with short sepia hairs. Head like back, but the colors more closely blended. Cheeks like sides. Muzzle hair brown. Ears and tail dark brown, the latter without trace of paler tip.

*Tail*.—The moderately long tail is coarsely conspicuous and uniformly annulated. At middle there are about 9½ rings to the centimeter. The rings are noticeably divided by cross furrows into scales slightly longer than broad, the distal edges of which are crenulate. Numerous stiff black hairs spring from beneath the free edges of the rings, usually three to each scale. In length the hairs about equal the width of the rings. At tip of tail the rings become closer and the hairs longer and less stiff but without forming a pencil.

*Skull*.—The skull of *Mus validus* (Pls. III and IV, Fig. 1) differs more widely from that of *M. bowersi* (Pls. III and IV, Fig. 4) than could be anticipated from the external similarity of the two animals.\* The latter in fact bears a superficial resemblance to the skull of *Mus vociferans*, differing chiefly in its more slender rostrum, larger audital bullæ, more convergent zygomata, and obsolete supraorbital ridges, characters all but one of which are directly the opposite to those of *Mus validus*. Supra-orbital ridges very prominent, and forming a distinct postorbital angle, behind which they are continued backward along sides of braincase to extremities of interparietal. The lower portion of the antorbital foramen, widely open in *Mus bowersi*, is here reduced to a mere slit, partly as the result of shortness of rostrum and consequent unusually close contiguity of root of incisor and anterior edge of outer wall of foramen. The plate forming this outer wall is broad, its outer surface distinctly concave. Anterior border strongly convex from a little below middle,

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\*For the opportunity to examine a specimen of *Mus bowersi* collected by Fea at Yado, Burmah, I am indebted to Dr. R. Gestro, of the Genoa Museum.

the basal straight portion directed *slightly forward*. Audital bullæ smaller than in *Mus bowersi*, though nearly double as large as in *M. vociferans*, subcircular in outline when viewed from the side.

*Teeth*.—The teeth are broader than in the other large rats from Trong, but the toothrow as a whole is not correspondingly lengthened. Enamel pattern of first upper molar as in *Mus decumanus*. In the second tooth a small but distinct antero-external tubercle is added to the number normally present.\* Occasionally this tubercle is connected with that of opposite side, so that the enamel pattern consists of three transverse folds as in the first tooth. Third molar like second, though smaller, and the elements of the tooth less distinct. This tooth is therefore of more complicated structure than that of *Mus decumanus*, owing to the addition of an anterior outer tubercle, and the normal division of the posterior crescent into two transverse loops.

*Measurements*.—External measurements of type: total length, 521; head and body, 254; tail vertebræ, 267; hind foot, 49 (46); ear from meatus, 20.6; ear from crown, 16; width of ear, 16. Another specimen, also a male: total length, 515; head and body, 248; tail vertebræ, 267; hind foot, 52 (49).

Cranial measurements of type: greatest length, 55; basal length, 48.6; basilar length, 45.6; palatal length, 26; least width of palate between anterior molars, 5; diastema, 14.6; length of incisive foramen, 9; combined breadth of incisive foramina, 3.6; length of nasals, 22.6; combined breadth of nasals, 6.2; zygomatic breadth, 28; interorbital breadth, 8; mastoid breadth, 19; breadth of braincase above roots of zygoma, 20; depth of braincase at anterior border of basioccipital, 15; fronto-palatal depth at posterior extremity of nasals, 13.4; least depth of rostrum immediately behind incisors, 10; maxillary toothrow (alveoli), 11; width of front upper molars, 3; mandible, 31; mandibular toothrow (alveoli), 10.

*Specimens examined*.—Two, both from the type locality.

*Remarks*.—Though this rat bears a strong superficial resemblance to *Mus bowersi* its skull and teeth show that there is no very close relationship between the two animals. Probably the Siamese animal is more nearly related to the Bornean *Mus infraluteus* Thomas. This species, which is slightly larger than *Mus validus*, and with actually as well as relatively shorter tail, differs from it further in darker general color, and in the dark underfur of the ventral surface. The skull is shorter and apparently broader, and the incisive foramina do not extend back to line of front of molars. The palate is said to be 32 mm. in length, while in *M. validus* it is only 26 mm. In the original description of *Mus infraluteus* the enamel pattern is not mentioned. It is therefore presumably normal and quite different from that of *M. validus*.

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\*A trace of this tubercle is usually visible close to the cingulum in *Mus decumanus*, but forming no part of the triturating surface of the crown.

*Mus cremoriventer* sp. nov.

*Type* adult male (skin and skull) No. 86,770 United States National Museum, collected in the mountains of Trong, Lower Siam, at about 3000 ft. altitude, January 16, 1899.

*Characters*.—A slender animal about the size of *Mus jerdoni* Blyth, from Mount Mooleyit, Burmah. Tail much longer than head and body, *dark brown throughout, thinly but distinctly penicillate*. Fur very thickly spinous. General color dull ochraceous above, whitish cream buff beneath. Skull shorter and relatively broader than that of *M. jerdoni*.

*Fur*.—As in *Mus jerdoni* the fur of the back and sides is composed of three kinds of hair, (a) soft fine underfur about 10 mm. in length, light gray at base and ochraceous at tip, (b) broad, grooved bristles slightly longer than the underfur, light horn color at base, those on back blackish at tip, those on sides uniform throughout, and (c) slender terete hairs 20 mm. in length, blackish throughout, but darker at tip than at base. The long hairs are rather abundant on back, most numerous posteriorly. On sides they soon disappear. On belly the bristles and underfur alone are present, both much reduced in length, and without dark bases. Legs nearly free from bristles except on outer side.

*Color*.—General color above dull ochraceous fading to ochraceous buff or dull buff yellow on sides, the sides nearly clear, but back, shoulders, neck and head uniformly sprinkled with black-tipped hairs and bristles which are nowhere in excess of the ochraceous. Cheeks clear ochraceous buff. Muzzle hair brown, paler at the sides. A narrow dark shade encircles each eye but without forming a distinct eyering. Underparts and inner surface of legs clear light cream buff to base of hairs, sharply defined and extending to wrists and ankles. Feet mixed whitish and sepia. Tail and naked ears uniform dark brown throughout.

*Tail*.—The slender tail is conspicuously and regularly annulated. At middle there are 11 or 12 rings to the centimeter. The rings are sharply marked off from each other, and so slightly divided by cross furrows that to the unaided eye they appear entire. With a lens they are seen to be made up of rectangular scales slightly longer than broad. The free edges of the rings are slightly crenulate and from beneath them spring stiff black hairs whose length slightly exceeds width of rings. There are usually three hairs to each division of the ring. Toward tip the rings become much narrower and the hairs longer, forming a thin but evident pencil.

*Skull*.—The skull of *Mus cremoriventer* (Pl. V, Fig. 2) is shorter and broader than that of *M. jerdoni* (Pl. V, Fig. 1). Its reduction in length is due more to shortening of the rostrum than of the braincase, so that the form of the skull is sensibly altered. Incisive foramina shorter and relatively broader than in *Mus jerdoni*, their posterior extremity on level with front of first molar. Antorbital foramen smaller than in *Mus jerdoni* but less contracted below. The maxillary plate forming its outer wall is narrow, the greatest width only 2.8 mm. Its anterior border is faintly concave below and faintly convex above, the general slope uni-

formly backward. Zygomata light though less slender than in *M. jerdoni*, not abruptly flaring anteriorly. Supraorbital ridges well developed and continued backward to interparietal, but not forming a distinct postorbital angle.

*Teeth*.—The teeth agree closely with those of *Mus jerdoni*. Arrangement of molar tubercles as in *M. jerdoni* and *M. decumanus*. Anterior face of incisors bright orange, the upper somewhat darker than the lower.

*Measurements*.—External measurements of type: total length, 317; head and body, 146; tail vertebrae, 171; pencil, 8; hind foot, 30 (28.5)\*; ear from meatus, 17; ear from crown, 13; width of ear, 12. A second specimen: total length, 305; head and body, 130; tail vertebrae, 175; hind foot, 30 (28.5)\*.

Cranial measurements of type: greatest length, 34; basal length, 28; basilar length, 25; palatal length, 13.4; least width of palate between anterior molars, 3.4; diastema, 8.2; length of incisive foramen, 5.6; combined breadth of incisive foramina, 2.6; length of nasals, 11.8; combined breadth of nasals, 4; zygomatic breadth, 15.4; interorbital breadth, 6; mastoid breadth, 12.8; breadth of braincase over roots of zygomata, 14.8; depth of braincase at front of basioccipital, 10; fronto-palatal depth at posterior extremity of nasals, 7; least depth of rostrum immediately behind incisors, 6; maxillary toothrow (alveoli), 6; width of front upper molar, 1.6; mandible, 15.6; mandibular toothrow (alveoli), 6.

*Specimens examined*.—Two, both from the type locality.

*Remarks*.—*Mus cremoriventer* differs too widely from the other species known to occur on the Malay Peninsula to require any special comparison. It is immediately recognizable by its moderate size, slender form, spiny fur, and long, unicolor, slightly penicillate tail.

*Mus asper* sp. nov.

*Type* adult female (skin and skull) No. 86,767 United States National Museum, collected in the mountains of Trong, Lower Siam, at an altitude of about 1000 ft., February 2, 1899.

*Characters*.—Smaller than *Mus jerdoni* (hind foot about 28 mm). Tail shorter than head and body, bicolor, but not white at tip. Fur of back very densely set with stiff bristles. General color raw sienna above, dull buff beneath, the fur everywhere dusky at base; a tawny spot on chest. Skull relatively broader than in *Mus jerdoni* or *M. cremoriventer*, the anterior portion of the zygomata more abruptly flaring and whole arch disproportionately heavy.

*Fur*.—The fur is as in *Mus jerdoni* and *M. cremoriventer*, except that the spines are more abundant on back and less numerous on sides and belly. Back with very few long terete hairs. Legs wholly free from bristles.

*Color*.—General color above raw sienna (slightly paler than Ridgway, Pl. V, Fig. 2) fading to light ochraceous on sides. Back, shoulders, neck, and head uniformly clouded or speckled with bister; this and the raw

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\*Distorted in preparation; measurement probably too long.

sienna present in about equal quantities. Bister soon disappearing on sides and cheeks. Muzzle hair brown, grayish at sides. A dark shade about eye. Underparts dull buff, sharply defined, much darker and browner than in *M. cremoriventer*, fading to buffy gray on chin and inner side of legs, down which it extends to join dull white of feet. A small tawny spot on middle of chest. *Fur of underparts everywhere conspicuously dusky at base.*

*Tail.*—Except for its shortness the tail is essentially like that of *M. cremoriventer*. The annulation, however, is a little less distinct, and the rings are more noticeably divided by cross furrows. In none of the specimens is the tail perfect to extreme tip, but there is no apparent tendency to form a pencil.

*Skull.*—The skull of *Mus asper* (Pl. V, Fig. 3) while of about the same length as that of *Mus jerdoni* (Pl. V, Fig. 1) differs conspicuously in the deeper rostrum, strongly cuneate nasals, larger antorbital foramen, heavier, more abruptly flaring and more depressed zygomatics, and larger, strongly angled supraorbital ridges. Incisive foramina short and broad, their outer margins convergent anteriorly. Interpterygoid space shorter and wider than in *Mus jerdoni*. Plate forming outer wall of antorbital foramen essentially as in *Mus cremoriventer*, and distinctly less convex above than in *Mus jerdoni*.

*Teeth.*—The teeth appear to be precisely like those of *Mus jerdoni*.

*Measurements.*—External measurements of type: total length, 254; head and body, 133; tail vertebrae, 121; hind foot, 27 (25.5); ear from meatus, 18; ear from crown, 13; width of ear, 14. An adult male from the type locality: total length, 235; head and body, 121; tail vertebrae, 114; hind foot, 28 (26.5). The hind foot in two specimens in alcohol measures respectively, 28.6 (27.4) and 26 (25).

Cranial measurements of type: greatest length, 34; basal length, 28; basilar length, 26; palatal length, 13.4; least width of palate between anterior molars, 3.6; diastema, 8.4; length of incisive foramen, 4.6; combined breadth of incisive foramina, 2.8; length of nasals, 11; combined breadth of nasals, 3.8; zygomatic breadth, 15.4; interorbital breadth, 5.8; mastoid breadth, 11.8; breadth of braincase above roots of zygomatics, 13.6; depth of braincase at front of basioccipital, 9.8; frontopalatinal depth at posterior extremity of nasals, 8; least depth immediately behind incisors, 6; maxillary toothrow (alveoli), 6; width of first upper molar, 1.4; mandible, 17.2; mandibular toothrow (alveoli), 5.4.

*Specimens examined.*—Six (two in alcohol), all from the type locality.

*Remarks.*—While *Mus asper* differs widely from the known mainland representatives of the genus it is probably rather closely related to the Bornean *Mus whiteheadi* Thomas, a species which I know by description only. *Mus asper* agrees with the Bornean animal in size, character of fur, color scheme, and general aspect of skull, but differs from it in its shorter tail, lighter color with stronger contrast between sides and belly, less developed maxillary plate forming outer wall of antorbital foramen; relatively wider incisive foramina, and apparently longer molar row.

*Mus pellax* sp. nov.

*Type* adult female (skin and skull) No. 86,755 United States National Museum, collected in the mountains of Trong, Lower Siam, at an altitude of about 1000 ft., February 5, 1899.

*Characters*.—Closely related to *Mus jerdoni* Blyth from Mount Mooleyit, Burmah, but with larger skull and teeth, much shorter incisive foramina and relatively smaller audital bullæ. *Nasals extending conspicuously behind nasal branches of premaxillaries*. White of inner side of thigh continued along lower leg to join that of foot, as in *Mus jerdoni*.

*Fur*.—The fur is as in *Mus jerdoni* and *M. cremoricenter*.

*Color*.—Back and sides clay color tinged with ochraceous, particularly on shoulders and flanks, and everywhere darkened by mixture of Vandyke brown, the latter in excess over middle of back, nearly disappearing on sides. Underparts white, sharply defined, this color extending down inner side of legs and covering dorsal surface of feet. Muzzle hair brown. Face and crown like back. An ill defined brown eyering. Between ears there is a conspicuous elongate white spot, possibly due to albinism. Ears dark brown. Tail bicolor, but not sharply so, light brown above, whitish below, the colors becoming indefinite near tip.

*Tail*.—The tail is indistinctly annulated; ten rings to the centimeter at middle. The rings are not sharply defined. Each is divided into segments distinctly broader than long. From beneath the free edges of the rings grows numerous hairs whose length about equals width of two rings. These hairs are not definitely arranged, and from one to four spring from each section. At tip the rings become very irregular, but the hairs, contrary to the general rule, are reduced in length.

*Skull*.—Though noticeably larger than that of *Mus jerdoni* the skull of *Mus pellax* does not differ from it in general form. The audital bullæ are a shade smaller than in *Mus jerdoni*, therefore relatively of much less size. Incisive foramina short and broad, the outer margins converging anteriorly. Nasals extending nearly 3 mm. behind nasal branches of premaxillaries. At anterior extremity each nasal is emarginated on outer side so that the two together form a narrow median point. Otherwise the skull agrees with that of *Mus jerdoni*.

*Teeth*.—The teeth are much broader than those of *Mus jerdoni*. Enamel pattern as in *M. jerdoni* and *M. decumanus* except in the presence of a minute supplemental tubercle between first and second tubercles on inner side of second upper molar. Though present and perfectly symmetrical in the tooth of each side it is probably not a normal character.

*Measurements*.—External measurements of type: total length, 317; head and body, 152; tail vertebrae, 165; hind foot, 35 (33); ear from meatus, 21; ear from crown, 16; width of ear, 17.

Cranial measurements of type: greatest length, 41; basal length, 34; basilar length, 31; palatal length, 17; least width of palate between anterior molars, 4; diastema, 11.5; length of incisive foramen, 6; combined breadth of incisive foramina, 3; length of nasals, 16; combined breadth of nasals, 4.8; zygomatic breadth, 18; interorbital breadth, 6.4; mastoid

breadth, 14; breadth of braincase above roots of zygomata, 16; depth of braincase at front of basioccipital, 10.8; fronto-palatal depth at posterior extremity of nasals, 8.8; least depth immediately behind incisors, 7; maxillary toothrow (alveoli), 6.8; width of first upper molar, 2; mandible, 21.5; mandibular toothrow (alveoli), 6.5.

*Specimens examined*.—One, the type.

*Remarks*.—While this species is very distinct from *Mus jerdoni*, its relationship to *Mus surifer* is questionable. Dr. Abbott writes that he examined numerous individuals and that in the flesh they could be invariably distinguished from the species with which they were associated. The white spot on the head he regards as a normal character.

***Mus surifer* sp. nov.**

*Type* adult male (skin and skull) No. 86,746 United States National Museum, collected in the mountain of Trong, Lower Siam, at an altitude of about 3,000 feet, January 14, 1899.

*Characters*.—In general appearance much like *Mus jerdoni* and *M. pellar*, but larger and more robust than either. Fur thickly spiny. Tail about equal to head and body, though usually somewhat longer, bicolor with exception of terminal third or fourth, which is entirely dull white. *Hind leg from knee to heel usually ochraceous on both sides* thus separating white of inner side of thigh from that of foot. Skull much larger and more conspicuously ridged than that of *Mus jerdoni*.

*Fur*.—The fur is as in *Mus jerdoni* and *M. cremoricenter*.

*Color*.—Upper parts uniform tawny ochraceous, heavily sprinkled with blackish brown on posterior half of back, less so on shoulders and head. Sides, flanks, cheeks and outer surface of legs clear tawny ochraceous. Underparts white to base of hairs. The white extends down inner sides of front legs to wrists, but on hind legs it normally reaches barely beyond knee, below which the entire leg is ochraceous, though slightly dulled on inner side by the dusky bases of the hairs. Occasionally, however, the white extends in a narrow irregular line to heel. Feet dull white. Ears and dorsal surface of tail to terminal third or fourth dark brown. Underside of tail and whole of terminal third or fourth dull white.

*Tail*.—The tail is distinctly annulated, though less evenly than in *Mus cremoricenter*. There are about 12 rings to the centimeter at middle. The rings are indistinctly divided into sections slightly longer than broad, from the free edge of each of which spring 1-3 hairs equal in length to width of about one and one half rings. At tip the rings become narrower and less regular, the hairs at the same time increasing in abundance, but not in length, and not forming a pencil.

*Skull*.—The skull of *Mus surifer* (Pl. V, Fig. 4) is conspicuously larger than that of *M. jerdoni* (Pl. V, Fig. 1), though not very different in form. Supraorbital ridges high and continued backward to interparietal, and in old individuals forming a strong postorbital angle. Incisive foramina relatively much shorter and wider than in *Mus jerdoni*, distinctly wider posteriorly than anteriorly.



*Teeth*.—The teeth are relatively broader than in *Mus jerdoni*, but in structure they show no peculiarities.

*Measurements*.—External measurements of type: total length, 400; head and body, 197; tail, 203; hind foot, 38 (36); ear from meatus, 21.5; ear from crown, 18; width of ear, 15. Ten specimens (five of each sex) from the type locality average: total length, 372 (356-400); head and body, 187 (162-197); tail vertebrae, 185.5 (175-203); hind foot, 38.6 (36-40); hind foot without claws, 35.8 (34-39).

Cranial measurements of type: greatest length 46 (36.6)\*; basal length, 40 (30); basilar length, 37 (27.6); palatal length, 19 (14.8); least width of palate between anterior molars, 4.6 (3.8); diastema, 13.4 (9.4); length of incisive foramen, 7.4 (6.6); combined breadth of incisive foramina, 4 (3); length of nasals, 18.6 (14); combined breadth of nasals, 5 (3.6); zygomatic breadth, 19.8 (15.4); interorbital breadth, 7.6 (6); mastoid breadth, 15 (13); breadth of braincase above roots of zygomata, 16 (15); depth of braincase at front of basioccipital, 12 (10.4); frontopalatal depth at posterior extremity of nasals, 9 (8); least depth of rostrum immediately behind incisors, 8 (6.8); maxillary toothrow (alveoli), 7 (6); width of front upper molar, 2 (1.6); mandible, 24.6 (18.6); mandibular molar series (alveoli), 7 (5.8).

*Specimens examined*.—Twenty-one, all from the type locality.

*Remarks*.—*Mus surifer* is somewhat closely related to *Mus jerdoni*, though immediately distinguishable by its much greater size. Two adult specimens of the latter measure: total length, 325 and 322; head and body, 200 and 192; tail vertebrae, 125 and 130; hind foot, 31.5 (30.5) and 30.5 (29.5); ear from meatus, 19 and 19; ear from crown, 16 and 16; width of ear, 14 and 13. Externally *Mus surifer* is probably much like the Bornean *Mus rajah* Thomas; but the skull is considerably smaller. Some of the cranial measurements of the type of *Mus rajah* are: greatest length, 51; basilar length, 41; zygomatic breadth, 22; nasals, 19; diastema 14.5

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\*Measurements in parenthesis are those of an adult specimen of *Mus jerdoni* from Mount Mooleyit, Burmah.

## EXPLANATION OF PLATES.

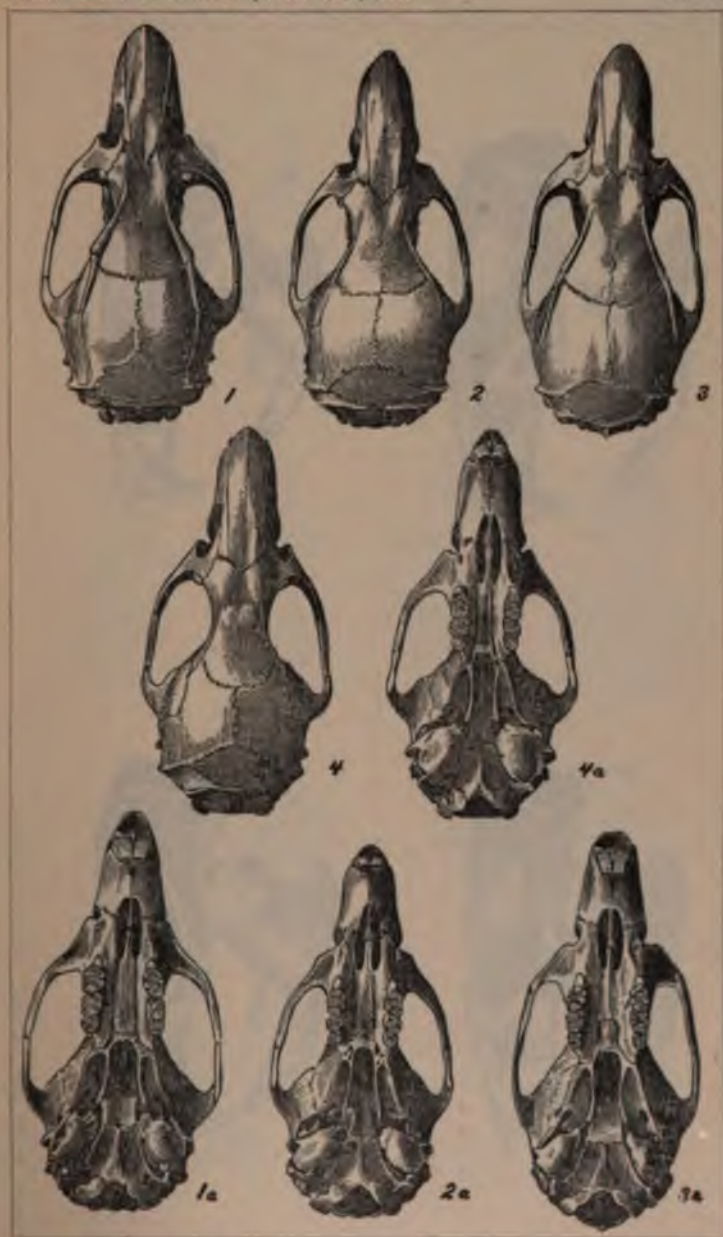
(All figures slightly less than natural size.)

## PLATES III AND IV.

- Fig. 1. *Mus ravidus*. Type.  
Fig. 2. *Mus ferreocanus*. Type.  
Fig. 3. *Mus roiferans*. Type.  
Fig. 4. *Mus boereri*. Adult male, Yado, Burmah (Genoa Museum).

## PLATE V.

- Fig. 1. *Mus jerdoni*. Adult female No. 101,520, United States National Museum. Mount Mooleyit, Burmah.  
Fig. 2. *Mus cremoricenter*. Type.  
Fig. 3. *Mus asper*. Type.  
Fig. 4. *Mus surifer*. Topotype. No. 86,760, United States National Museum. (A much younger specimen than that of *M. jerdoni*.)



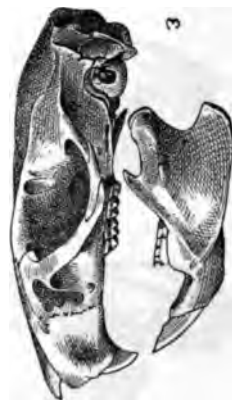
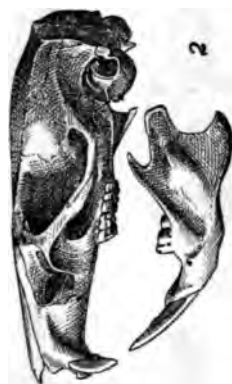
1. *Mus validus*.

2. *Mus ferreocanus*.

3. *Mus vociferans*.

4. *Mus bowersi*.





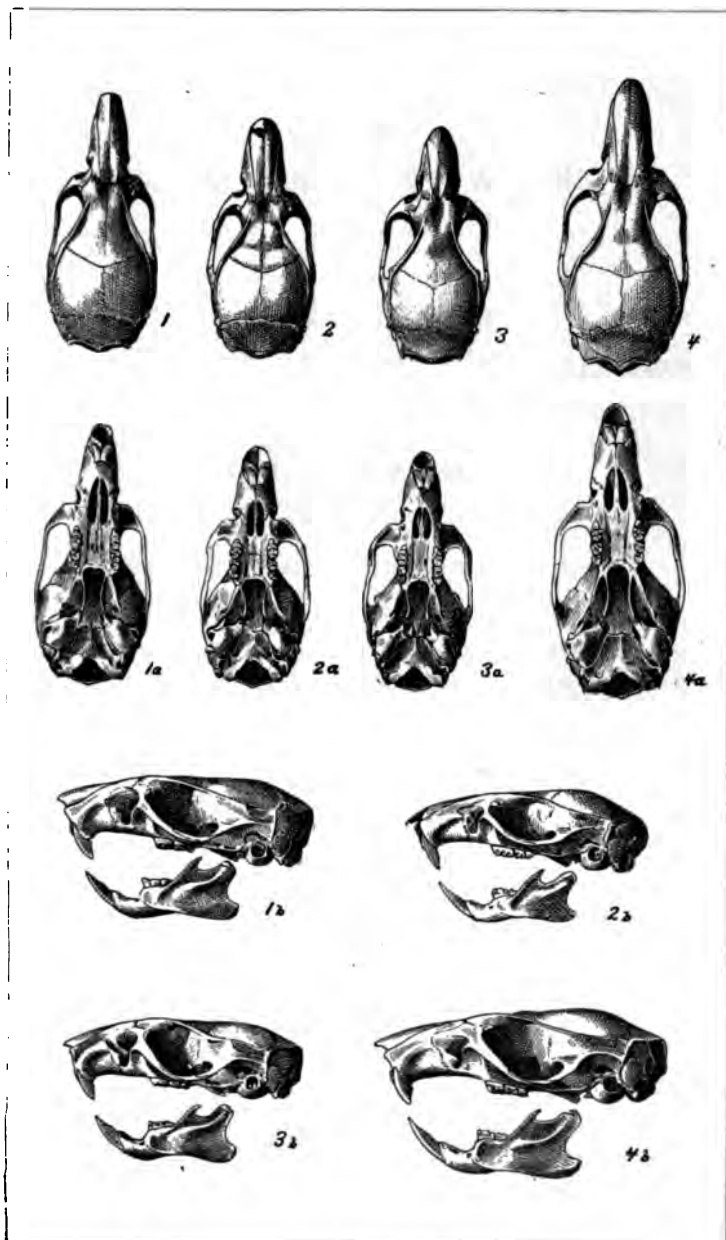
1. *Mus validus*.

2. *Mus ferrocaneus*.

3. *Mus vociferans*.

4. *Mus bowersi*.





1. *Mus jerdoni*.

2. *Mus cremoriventer*.

3. *Mus asper*.

4. *Mus surifer*.





PROCEEDINGS  
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DESCRIPTIONS OF TWO NEW MAMMALS FROM  
CALIFORNIA.

BY C. HART MERRIAM.

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*Sciuropterus oregonensis stephensi* subsp. nov.

CALIFORNIA COAST FLYING SQUIRREL.

*Type* from Sherwood, Mendocino Co., Calif. (alt. 2500 ft.) No. 99,830 ♀ yg. ad., U. S. Nat. Mus., Biological Survey Coll. Collected May 10, 1894, by F. Stephens. Orig. No. 2307.

*Character.*—Similar to *oregonensis* but smaller and paler; underparts and underside of tail without trace of fulvous suffusion. Skull smaller; occipital region much more strongly decurved; frontals narrower inter-orbitally and broader posteriorly; nasals and premaxillæ narrower posteriorly.

*Measurements.*—Type specimen. ♀ ad: Total length 277; tail vertebrae 131; hind foot 37.

*Remarks.*—In coloration this subspecies resembles *klamathensis* much more closely than *oregonensis*, but it is slightly darker than *klamathensis* and has much smaller ears and audital bullæ.

*Procyon pallidus* sp. nov.

DESERT RACCOON.

*Type* from New River, Colorado Desert, Calif. No. 99,272 ♀ ad., U. S. Nat. Mus., Biological Survey Coll. Collected Oct. 16, 1899 by F. Stephens. Orig. No. 2246.

*Character.*—Size medium; coloration uniform pale gray, very much paler and grayer than any other known form; head markings relatively narrow, the dark dividing the white bar between the eyes less distinctly black than in the other species. There is no yellowish suffusion in the pelage anywhere, not even on the tail. The tail rings may be traced all

the way around although the basal ones on the underside are very indistinct.

*Cranial characters.*—Skull similar in general to that of *paora*, resembling it much more closely than that of *hernandezii*. It differs from *paora*, however, in having the jugal much narrower below the orbit, and in having the lower premolars larger and more crowded. The fourth lower premolar in particular is much more swollen than in *paora*.

*Measurements.*—(Type specimen, ♀, in flesh:) Total length 855; tail vertebrae 295; hind foot 128.

## DESCRIPTION OF A NEW HARVEST MOUSE (REITHRODONTOMYS) FROM MEXICO.

BY C. HART MERRIAM.

### *Reithrodontomys chrysopsis* sp. nov.

*Type* from Mt. Popocatepetl, Mexico. No. 52,031 ♂ ad. U. S. Nat. Mus., Biological Survey Coll. Collected Feb. 25, 1893 by E. W. Nelson and E. A. Goldman. Orig. No. 4405.

*Characters.*—Size small; ears large and moderately haired; tail very long, slender and well haired; fur long and very soft; color golden-yellowish.

*Color.*—Upperparts from nose to tail rich bright golden-yellowish, somewhat darkened on back and rump by admixture of black hairs; underparts whitish suffused with pale salmon fulvous; ears and ankles dusky; fore and hind feet white; tail sharply bicolor: above dusky, below white.

*Cranial characters.*—Skull small and frail; braincase papery, inflated, subglobular posteriorly and everywhere well rounded; interorbital region narrow, without trace of supraorbital beads; zygomata slender but strongly notched by antorbital slits; rostrum small and very narrow; audital bullae rather small; incisive foramina very long, cutting plane of first molars, and of even breadth throughout.

*Measurements.*—Type specimen: Total length 194; tail vertebrae 108; hind foot 21. Average of two specimens from type locality: Total length 185.5; tail vertebrae 100; hind foot 20.5.

PROCEEDINGS  
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DESCRIPTIONS OF TWO NEW MAMMALS FROM  
SOUTHERN CALIFORNIA.

BY F. STEPHENS.

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*Perognathus panamintinus arenicola* subsp. nov.

*Type* from San Felipe Narrows, San Diego Co., California. No. 99,828, ♂, U. S. Nat. Mus., Biological Survey Coll. Collected April 11, 1892 by F. Stephens. Orig. No. 2056.

*Characters*.—Similar to *P. panamintinus bangsi* but paler and whiter; mastoids greatly swollen and projecting much further back than the occiput; interparietal very small.

*Measurements*.—Total length, 141; tail vertebrae, 82; hind foot, 19.

*Myotis californicus pallidus* subsp. nov.

*Type* from Vallecito, San Diego Co., California. No. 99,829, ♂, U. S. Nat. Mus., Biological Survey Coll. Collected April 1, 1895 by F. Stephens. Orig. No. 2498.

*Characters*.—Size small; wings short, wing membrane thin and light; ears small; general appearance delicate, color very pale: light ochraceous buff or brownish cream buff; below dull white; basal part of pelage above and below blackish.

*Measurements*.—Total length, 80; expanse, 208; tail vertebrae, 42; ear, 11; thumb, 4; forearm, 30; tibia, 15.

## GENERAL NOTES.

The *Vespertilio concinnus* of Harrison Allen.

Through the kindness of Mr. Witmer Stone I have recently had the opportunity to examine the bats on which Harrison Allen based the name *Vespertilio concinnus* (Proc. Acad. Nat. Sci. Philadelphia, 1866, p. 280). The specimens, two in number, are in alcohol, and labeled "San Salvador, Dr. J. Leidy." Though much faded in color they are clearly referable to *Myotis nigricans* (Maximilian), or at least to that form of the species occurring in Columbia and southern Mexico. The name *concinnus* is therefore a synonym of *nigricans* unless the bat to which it was applied should eventually prove to be distinct from the true *nigricans* of Brazil, specimens of which I have not seen. In that case it would be tenable for the northern animal.—Gerrit S. Miller, Jr.

The generic name *Evotomys* not invalidated by *Anaptogonia*.

In a posthumous paper on the fauna of the Port Kennedy bone fissure (Journ. Acad. Nat. Sci., Philadelphia, 2d Ser. XI, p. 201) Cope substituted the name *Anaptogonia* Cope 1871 based on a fossil Microtine rodent for *Evotomys* Coues 1874 originally applied to the Redbacked Mice. The change was made on account of the supposed generic identity of the fossil and living animals. Through the courtesy of Mr. Witmer Stone I have recently had an opportunity to examine two specimens of *Anaptogonia* from the collection of the Philadelphia Academy of Sciences. This material shows that *Anaptogonia*, although provided with rooted molars, is in no way closely related to *Evotomys*. The teeth are as large as in *Microtus* (*Neofiber*) *alleni*, and the enamel pattern is characterized by acute angularity. The genus thus resembles the "*Arricola intermedius*" of Newton and the *Dobomys* of Nehring. Therefore the name *Evotomys* as applied to the Redbacked Mice is in no way invalidated by the previous publication of *Anaptogonia*.—Gerrit S. Miller, Jr.

Note on *Micronycteris brachyotis* (Dobson) and *M. microtis* Miller.

In describing a bat from Greytown, Nicaragua, under the name *Micronycteris microtis* (Proc. Acad. Nat. Sci. Philadelphia, 1898, p. 328), I overlooked the fact that Dobson had previously (Proc. Zool. Soc. London, 1878, p. 880) described a member of the same genus from Cayenne, French Guiana, as *Schizostoma brachyote*, a name not cited in Trouessart's 'Catalogus.' The two animals are evidently much more distinct from each other than the similarity of their specific names would at first suggest. *Micronycteris brachyotis* is, with the exception of *M. behnii*, one of the largest species of the genus (forearm 40 mm.), while *M. microtis* is among the smallest (forearm 31). In *M. brachyotis* the

upright portion of the noseleaf is "much narrower than the horse-shoe," and the prominences on the chin are of very peculiar form. In *M. microtis* the upright portion of the noseleaf is fully as wide as the 'horse-shoe,' and the prominences on the chin are exactly as in normal members of the genus. *Gerrit S. Miller, Jr.*

#### The systematic name of the Cuban red bat.

In Ramon de la Sagra's *Historia Fisica Politica y Natural de la Isla de Cuba*, III, p. 32, 1845, Gervais describes the cuban red bat as *Vespertilio blonsceillii*. Publication of the name he attributes to Lesson and Garnot, "Bull. Sc. Nat. VIII, p. 95." This reference I have not been able to verify, but it unquestionably antedates the publication of Gundlach's name *Atalapha pfeifferi* (1861) by sixteen years. The animal should therefore be known as *Lasiurus blonsceillii*. *Gerrit S. Miller, Jr.*

#### Note on the *Vespertilio blythii* of Tomes.\*

In 1857 Tomes published a description of the Indian representative of *Myotis myotis* under the name *Vespertilio blythii* (Proc. Zool. Soc. London, 1857, p. 53). Recent authors have without exception regarded the animal as identical with the European form. A specimen collected by Dr. W. L. Abbott in Kashmir (♂ adult No. 44342 United States National Museum) shows, however, that this view is not correct, and that *Myotis blythii* is a well characterized species, readily distinguishable from *M. myotis* by its shorter ears, much smaller audital bullae, and by a peculiarity in the form of the maxillary molars. In these teeth the protocone is lower and further removed from the paracone than in *M. myotis*, a character which is at once appreciable when the teeth of the two species are viewed in profile from the front. This peculiarity is evidently of considerable importance, as I can find no appreciable variation in the form of the molars among a large number of European specimens of *M. myotis*. *Gerrit S. Miller, Jr.*

#### The *Scotophilus pachyomus* of Tomes a valid species.

Described in 1857 (Proc. Zool. Soc. London, p. 50) from specimens taken in India the *Scotophilus pachyomus* of Tomes has of recent years been regarded as inseparable from the European Serotine Bat (see Dobson, Catal. Chiropt. Brit. Mus., p. 191, and Blanford, Mamm. Brit. India, p. 303). Two individuals taken by Dr. W. L. Abbott in the Vale of Kashmir and now in the United States National Museum (Nos. 44351 and 44352) agree in all respects with the characters given by Tomes and

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show that the animal differs widely from *Vespertilio serotinus*. It is slightly larger than the European species, (forearm 52, foot 12 (10.4), tibia 22.4), the skull is broader anteriorly, the crowns of the upper molars are less narrowed on the lingual side and the color is much paler. Fur very silky in texture, about 3 mm. in length at middle of back. Hairs of dorsal surface light broccolibrown from base nearly to tip, then dark sepia, followed by silvery gray at extremity. The colors blend insensibly into each other, and the whitish tips of the hairs produce a frosted effect nearly as distinct as that in *V. murinus*. Fur of ventral surface very pale ecru drab at base, fading to whitish gray at tip; a fairly defined line of demarkation between colors of upper and lower surfaces. These characters are sufficient to distinguish *Vespertilio pachyomus* specifically from *V. serotinus*.—Gerrit S. Miller, Jr.

#### A Bat of the genus *Lichonycteris* in South America.

*Lichonycteris obscurus*, the only known representative of its genus, was described in 1895 from a single adult female taken at Managua, Nicaragua (Thomas, Ann. and Mag. Nat. Hist., 6th ser., XVI, pp. 55-57, July, 1895). While identifying some old skins in the United States National Museum I recently found a specimen of this species labeled "Surinam, Edw. Koebel." It is without further history except that it was entered in the Museum register, as No. 14815 on March 6, 1885. The known range of the genus is thus greatly extended. In all respects the Surinam specimen exactly agrees with the character given in the original description.—Gerrit S. Miller, Jr.

#### The systematic name of the large noctule bat of Europe.

The first notice of the Large Noctule of southern Europe appears to have been published in 1869 by Fatio in the first volume of the "Faune des Vertébrés de la Suisse. Here specimens taken in the trunk of a tree near Amsteg, Canton of Uri, Switzerland, were recorded as [*Peropus noctula*] var. *marima* (Mammifères, p. 57). More recently the animal has been considered identical with the *Pterygistes lasipterus* of China and Japan (For references see Trouessart, Catalogus Mammalium, I, p. 111). Two specimens from Pisa, Italy, recently obtained by the United States National Museum differ noticeably from a pair of *P. lasipterus* collected some years ago by Mr. P. L. Jouy at Fusan, Corea. They are distinctly larger (forearm, ♂, 65, ♀, 68, instead of ♂, 60, ♀, 61), and the skull, in addition to its larger size (greatest length 22 instead of 20.4), differs in its more tumid rostrum, broader anterior nares, and narrower interpterygoid space. The European animal which in all probability is specifically distinct from *Pterygistes lasipterus* should be known as *Pterygistes maximus* (Fatio).—Gerrit S. Miller, Jr.

A new subgenus for *Lepus idahoensis*.

The small rabbit described by Merriam in 1891 (North American Fauna No. 5, p. 76) as *Lepus idahoensis* differs too widely from members of any of the recognized subgenera to be associated with them. It may therefore be regarded as the type of a new subgenus *Brachylagus*. The characters are as follows: Skull short and deep, the disproportionately large audital bullae and small rostrum (diastema shorter than orbit) producing a strikingly immature effect; supraorbital processes shorter than toothrow, their extremities free; posterior prism of second lower premolar and first and second lower molars less than half as large as anterior; ears, legs, and tail short, the latter not perfectly formed.—*Gerrit S. Miller, Jr.*

*Antennaria solitaria* near the District of Columbia.

Although not included in recent works on the flora of the northeastern United States, *Antennaria solitaria* is entitled to a place there. In May, 1890, I found the plant growing in dry, open, deciduous woods near the side of a road a mile or more east of Kensington, Montgomery Co., Maryland, well within the limits commonly assigned to the flora of the District of Columbia. It apparently occupies a small area only, though this year it has spread. The species has been recorded (as *Antennaria plantaginifolia*  $\beta$ . *monocephala*) from the vicinity of Philadelphia, Pa., (Torrey and Gray, Fl. N. Am., II, p. 431) and there is every reason to expect its occurrence throughout the Austral zones of the eastern United States. — *Gerrit S. Miller, Jr.*

*Batrachium hederaceum* in America.

Up to the present year, so far as I have been able to ascertain, *Batrachium hederaceum* (L.) S. F. Gray, has been credited to the following stations and collectors only: Virginia: Hampton ("Chesapeake City"), Ward, 1877; Vasey, 1878; Norfolk, Ward, 1877, Muir; Dismal Swamp, Chickering, 1877; Virginia Beach, Britton & Small, 1893; Newfoundland: Bona Vista Bay, Osborn, 1879; New Harbour, Waghorne, 1889 and 1890; Quiddy Viddy Lake, Robinson & Schrenk, 1894.

The first record by name of station of the introduction of this species from Europe is Dr. Watson's in the sixth edition of Gray's Manual, 1890. The second is Mr. J. M. Macoun's note (Bot. Gaz. 16: 285. 1891) on the plants collected by the Rev. A. C. Waghorne, assigning to them the record of being the first collected in Canada. If Mr. Macoun had access to the specimens distributed by Mr. H. L. Osborn, he did not give them the first Canadian credit because they were distributed under the name *Ranunculus hyperboreus* Pursh.

Dr. Robinson in Gray's Synoptical Flora (Vol. I, Pt. I, Fasc. 1: 22. 1895) cites Mr. Muir in connection with the station given in the Manual and appends a foot-note naming the above collectors except Messrs.

Ward, Vasey and Britton & Small. From these omissions I infer that their collections were not published or widely distributed.

Professor Ward tells me that when he and Dr. Morong were approaching the "Chesapeake City" station, he remarked that "that is a regular ranunculaceous pool." So it proved, for, besides *B. hederaceum* they collected *Ranunculus pusillus* and two other species.

With these two limited areas for the adopted habitat of this species it was a surprise to Mr. W. M. Pollock and myself, on May 6, 1900, to find specimens bearing flowers and fruit, in a large swamp bordering the Patuxent River at the mouth of its Western Branch, practically at the head of navigation. There were two distinct patches of the plant, one rather badly cut up by the passage of teams over a temporary farm road. The patches were growing in standing water about two inches deep, over a thin deposit of humus upon compact marl.

In Britton & Brown's Illustrated Flora (Vol. II: 84) the season of flowering is given as "June to August." The plants collected by Britton & Small were barely in flower on May 26. Professor Ward's specimens were barely in fruit on May 12. The plants from the new station were in full bloom and ripe fruit. These fruits probably could not have matured from flowers which were in anthesis later than the last week in April. With this collection, then, the range is increased and the known period of blossoming lengthened.

Dr. Britton writes me that the habit of the plant at Virginia Beach has led him to expect it elsewhere along tide-water areas. We shall interestedly await news of other stations.—*E. L. Morris, Dept. of Biology, Washington High Schools.*

#### Change of name.

*Baptisia confusa* Pollard and Ball, nom. nov.

*B. Terana* Pollard and Ball, Proc. Biol. Soc. Wash., 13:133. April 6, 1900.

*B. lanceolata terana* Holzinger, Contr. U. S. Nat. Herb., 1:286. Oct. 31, 1893. Not *B. Terana* Buckley, Proc. Acad. Sci. Phila., 452. 1862.

Through inadvertence, Mr. Holzinger's variety was elevated to specific rank in ignorance of the fact that the name *Terana* was applied many years ago by Buckley to another species. Our attention has been considerably called to the error by Dr. B. L. Robinson.—*Charles Louis Pollard, Carlton R. Ball.*



PROCEEDINGS  
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A SECOND COLLECTION OF BATS FROM THE  
ISLAND OF CURAÇAO.\*

BY GERRIT S. MILLER, JR.

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Mr. Leon J. Guthrie, United States Weather Observer at Willemstad, Curaçao, West Indies, has recently sent to the United States National Museum a second collection of bats preserved in formalin.† Three species are added to the known fauna of the island, though two of those previously obtained, *Myotis nesopolus* and *Leptonycteris curasoae*, are not represented. The number of bats recorded from Curaçao is thus raised to six, all of which are so far as known peculiar to the island.

*Glossophaga elongata* Miller.

Twenty-seven specimens, taken from caves and rock fissures in different parts of the island, but chiefly from a large cave at Hatto, a country estate, about thirty miles from Willemstad. Among the fifty-six individuals of this species examined four have the incisors noticeably defective, while in only one of these are the teeth absent. This condition is in marked contrast with that recently observed by Dr. J. A. Allen in a series of thirty-four specimens of the closely allied *Glossophaga longi-*

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†For account of the first collection, see Proc. Biol. Soc. Washington, xiii, pp. 123-127, April 6, 1900.

*rostris* of Colombia. Here the incisors were absent in about one-third of the individuals, and the full set was present in less than one-half.\*

*Mormoops intermedia* sp. nov.

*Type* adult female (in alcohol) No. 102,174 United States National Museum, collected in cave at Hatto, on north coast of Curaçao, West Indies, April 29, 1900.

*Character.*—Similar to the Mexican *Mormoops megalophylla* Peters, but smaller, the size intermediate between that of the two previously known species; color (at least in brown phase) slightly darker than in *M. megalophylla*.

*Color.*—Brown phase: entire dorsal surface sepia, the fur paler beneath the surface, and each hair tipped with light drab. The drab tips produce a distinct 'bloom' in certain lights. Underparts very pale yellowish broccoli-brown, lightest on belly, flanks and pubic region, faintly darker across chest. Red phase: like brown phase but entire pelage suffused with cinnamon. Pale phase: light salmon-buff above and below, becoming more red about shoulders and head. Ears and membranes dark brown in all three color phases. Individuals in the brown phase are the most frequent; those in the red phase are less often met with; while the pale phase is comparatively rare.

*Membranes, ears,* and other external characters as in *Mormoops megalophylla*.

*Skull and teeth.*—While the skull exactly resembles that of *Mormoops megalophylla* the teeth are distinguishable by the greater size and consequent crowding of the upper premolars. The anterior premolar is distinctly broader than in *M. megalophylla* and it usually fills the entire space between canine and posterior premolar. The lower premolars are slightly larger than in the Mexican animal.

*Measurements.*—External measurements of type specimen: total length, 80; tail, 20; tibia, 20; foot, 9; calcar, 20; forearm, 48; thumb, 6.4; second digit, 45; third digit, 90; fourth digit, 6.6; fifth digit, 57; ear from meatus, 14; ear from crown, 9. Average of twenty topotypes: tail, 20.9 (18-22); forearm, 49.6 (48-51).†

*Specimens examined.*—One hundred and sixty-four from caves and rock crevices in all parts of the island.

*Remarks.*—*Mormoops intermedia* is readily distinguishable from *M. megalophylla* by its size and more crowded upper premolars. With the Jamaican *M. blainvillii* it needs no comparison. The color phases in this bat are very striking.

*Natalus tumidirostris* sp. nov.

*Type* adult male (in alcohol) No. 102,106 United States National Museum, collected in cave at Hatto, on north side of island of Curaçao, West Indies, May 1, 1900.

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\*Bull. Am. Mus. Nat. Hist., N. Y., xiii, p. 89, May 12, 1900.

†Average of twenty specimens of *M. megalophylla* from Mirador, Vera Cruz, Mexico; tail, 27.8 (26-32); forearm, 54 (53-57).

*Character.* Externally similar to Mexican specimens of *Natalus stramineus* Gray, but fingers shorter and ears somewhat more pointed. Skull with braincase more abruptly elevated than in the Mexican species, and *rostrum conspicuously inflated at sides*. Teeth throughout larger than in *N. stramineus*, the lower premolars noticeably broadened.

*Color.* Dorsal surface uniform cream-buff, the tips of the hairs gradually darkening to pale drab; belly similar, but the buff slightly more tinged with yellow and the drab less apparent. Ears and membranes light brown.

*Ears.* The ear is essentially as in *N. stramineus*, but the point is distinctly longer and narrower.

*Membranes, feet,* and other external characters as in *N. stramineus*.

*Skull.* Though in general appearance the skull of *Natalus tumidirostris* resembles that of *N. stramineus* it is immediately distinguishable by the conspicuously swollen sides of the rostrum. The inflation involves the maxillary bones from anterior edge of orbit almost to nares, and from near edge of toothrow to nasals. As the nasals retain the normal form they appear to occupy the floor of a broad, shallow, longitudinal groove. In the type the braincase rises above the dorsal plane of the rostrum at an angle of  $50^{\circ}$ , in a second specimen at an angle of  $58^{\circ}$ . In two specimens of *N. stramineus* the angle is respectively  $34^{\circ}$  and  $40^{\circ}$ . In both specimens of *Natalus tumidirostris* the bony palate terminates on each side at the plane of the postero-internal angle of the crown of the second molar. In the median line it is continued slightly further back along palatal face of vomer. The resulting form is strikingly different from that of the palate in other members of the genus. It is possible, however, that the palate is normal and that its peculiarity in the two specimens is the result of injury. As both skulls were cleaned by an experienced preparator there seems little probability that the palate was originally of the usual form.

*Teeth.*—The dentition is throughout heavier than in *N. stramineus*, and the form of the individual teeth differs in many important details. Canines and incisors as in *N. stramineus*. Relative size of upper premolars as in *N. stramineus*, that is the crown area decreasing regularly from third to first, the latter equal to about one-half former, but cusp of first slightly longer than that of second. In each tooth the transverse diameter is greater relatively to the longitudinal diameter than in the Mexican animal. Upper molars broader than in *N. stramineus*, the posterior commissure of protocone of first and second *distinctly marked by a rudimentary hypocone*. The lower premolars and molars differ from those of *N. stramineus* in greater breadth of crown, this character especially noticeable in the second and third premolars.

*Measurements.*—External measurements of type (♂) and paratype (♀): total length, ♂ 90, ♀ 91; tail, ♂ 47, ♀ 45; tibia, ♂ 18.4, ♀ 17.6; foot, ♂ 7, ♀ 8; forearm, ♂ 36, ♀ 35; thumb, ♂ 5, ♀ 4.8; second digit, ♂ 35, ♀ 35; third digit, ♂ 72, ♀ 69; fourth digit, ♂ 52, ♀ 50; fifth digit, ♂ 51, ♀ 49; ear from meatus, ♂ 15.4, ♀ 15.4; ear from crown ♂ 11.4, ♀ 12.

*Specimens examined*.—Two, both from the type locality.

*Remarks*.—This species requires no special comparison with other members of the genus, its tumid rostrum at once distinguishing it.

***Molossus pygmaeus* sp. nov.**

*Type* adult female (in alcohol) No. 102, 104 United States National Museum, collected in an attic near Willemstad, Curaçao, West Indies. January 16, 1900.

*Characters*.—Considerably smaller than *Molossus obscurus*; color paler and molar teeth narrower than in the mainland animal.

*Color*.—Back broccoli-brown faintly washed with drab, the hairs whitish gray through basal half, this color appearing irregularly at surface. Belly drab-gray the hairs faintly whitish through basal half.

*Skull and teeth*.—Except for its smaller size the skull does not differ noticeably from that of mainland specimens. The crowns of the molar teeth are, however, relatively narrow. Rudimentary hypocone of first upper molar nearly obsolete.

*Measurements*.—External measurements of type: total length, 86 (98)\*; tail vertebrae, 34 (38); tibia, 11.8 (14); foot, 6.8 (7.8); forearm, 35 (39); thumb, 6 (6.4); second digit, 35 (40); third digit, 70 (78); fourth digit, 52 (60); fifth digit, 37 (42); ear from meatus, 10 (12); ear from crown, 8 (10); width from ear, 10 (14).

Cranial measurements of type: greatest length, 14.8 (16.4)\*; basal length, 13 (14.8); basilar length, 11 (13.6); lachrymal breadth, 4.8 (5.4); least interorbital breadth, 3 (4); zygomatic breadth, 9.6 (10.6); mastoid breadth, 9 (10); greatest breadth of braincase, 8 (9); depth of braincase, 5 (6); mandible, 10.4 (11.8); maxillary toothrow (exclusive of incisors), 5.6 (6); mandibular toothrow (exclusive of incisors), 6 (7).

*Specimens examined*.—One, the type.

*Remarks*.—*Molossus pygmaeus* belongs to a group of species the numbers of which are even smaller than *M. obscurus* and its allies. The animal is probably confined to the island of Curaçao.

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\*Measurements in parenthesis are those of an adult female *Molossus obscurus* from La Guaira Venezuela.

PROCEEDINGS  
OF THE  
BIOLOGICAL SOCIETY OF WASHINGTON

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A NEW GERBILLE FROM EASTERN TURKESTAN.\*

BY GERRIT S. MILLER, JR.

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Three specimens of *Gerbillus* collected by Dr. W. L. Abbott in Eastern Turkestan near Aksu and in the jungle east of Maralbashi have heretofore been referred with some hesitation to *G. przewalskii* Büchner, a species known from a few localities in the Tarim Valley near Lob Nor on the opposite side of the Desert of Gobi. A paratype of Büchner's animal received in exchange from the St. Petersburg Museum shows that the identification of the Aksu specimens is incorrect and that they represent a distinct and easily recognizable species.

*Gerbillus arenicolor* sp. nov.

*Type* adult male (skin and skull), No. 62,143 United States National Museum, collected in the jungle on Yarkand River, east of Maralbashi, Eastern Turkestan, February 9, 1894.

*Characters*.—In size and form similar to *Gerbillus przewalskii* Büchner, but color light sandy gray instead of pale yellowish buff.

*Color*.—Dorsal surface of body and head a fine sandy grizzle produced by a mixture of pale buff, dark brown, and pale ecru-drab, the brown most conspicuous near median line, but never in excess of the paler

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colors, the ecru-drab especially noticeable on sides, cheeks and shoulders. Ears and ill defined area immediately surrounding each dull white. A whitish spot above and slightly behind eye. Underparts and entire front leg white. On hind leg the color of back extends nearly to ankle. Feet white, slightly gray-tinged. Fur of colored area of pelage gray (Ridgway, No. 6) through a little more than basal half, that of uncolored area white to base. Tail uniform pale buff throughout.

*Skull.*—The skull closely resembles that of *Gerbillus przewalskii*, but the rostrum appears to be more slender (particularly when viewed from below) and the braincase longer in proportion to its breadth. In each of the three specimens of *G. arenicolor* the mastoid breadth is distinctly less than the distance from posterior edge of interparietal to naso-frontal suture, while in the paratype of *G. przewalskii* it is equal to this distance. Mandible and teeth as in *G. przewalskii*.

*Measurements.*—External measurements of type: total length, 162; head and body, 89; tail vertebrae, 73; hind foot, 26.4 (24).

Cranial measurements of type: greatest length, 27.4 (26)\*; basal length, 24 (23); basilar length, 22 (21); nasals, 9 (8.6); diastema, 8 (7); zygomatic breadth, 16 (15); least interorbital breadth, 6 (6); mastoid breadth, 15 (15); distance from posterior margin of interparietal to naso frontal suture, 17.4 (15); mandible, 14.8 (14); maxillary tooththrow (alveoli) 4 (4); mandibular tooththrow (alveoli), 4 (4).

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\*Measurements in parenthesis are those of the paratype of *G. przewalskii*.

PROCEEDINGS  
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GENERAL NOTES.

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The Systematic Name of the Cuban Red Bat.

In this journal Mr. Gerrit S. Miller, Jr., recently (xiii, p. 155, June 13, 1900) raised the question of the proper systematic name of the Cuban Red Bat, *Lasiurus pfeifferi* (Gundlach, 1861, et auct. recent.), claiming that it should be *L. blonservillii* Gervais, or Lesson and Garnot. The history of the name *blonservillii* is as follows: In 1826, Lesson and Garnot (Voy. de la Coquille, I, 1826, 137, pl. ii, fig. 1) described and figured a bat of the genus *Lasiurus*, from the Rio de la Plata, as *Vespertilio bonariensis*. In an unsigned abstract of this work in Férussac's Bulletin des Sciences naturelles et de Géologie, Vol. xiii, 1826, pp. 95, 96, under the title "Mammifères nouveaux ou peu connus, décrits et figurés dans l'Atlas zoologique du Voyage autour du monde de la corvette la Coquille; par MM. Lesson et Garnot," descriptions are given of seven species of mammals, of which the first is *Vespertilio blonservillii*, the description being a transcript of the Latin diagnosis of *Vespertilio bonariensis* from Lesson and Garnot's "Voyage," with the addition "Hab. Monte-Video." As the plate carries the name *Vespertilio bonariensis* as well as the text, the name *Vespertilio blonservillii* is evidently a pure synonym of *V. bonariensis*. The suggestion of the name *blonservillii* is evidently to be found in Lesson and Garnot's text; these authors say that this bat "de Buenos Ayres nous fut remis par l'un de nos officiers, M. de Blonville, qui le prit sur un vaisseau mouillé dans la rivière de la Plata."

Gervais, in 1845 (in R. de la Sagra's Hist. fis., polit. y nat. de la Isla de Cuba, iii, 32) simply applied the name *Vespertilio blonservillii* to the Cuban Red Bat (subsequently named *Atalapha pfeifferi* by Gundlach, in 1861), believing it to be specifically the same as that described by Lesson and Garnot, as above explained, rightly citing for the name Férussac's Bulletin, but wrongly citing for it Lesson and Garnot's report on the zoology of the Voyage of the Coquille. The proper systematic name of the Cuban Red Bat is, therefore, *Lasiurus pfeifferi* (Gundlach) as of late currently employed.—J. A. Allen.

**On the occurrence of a Bat of the genus *Mormoops* in the  
United States.**

An adult female of *Mormoops megalophylla* Peters, a bat new to the United States was taken by me at Fort Clark, Kinney County, Texas, December 3, 1897. A lady called me to her house to see a 'very remarkable bat' which had attached itself to the inner side of a door-screen. I found this bat very much alive, at a season when all other bats of the locality were dormant or had migrated. No other bats were seen until the following March, when the common *Nyctinomus* reappeared in the usual abundance. This specimen (No. 84,801, collection of the United States National Museum; original No. 4273) identified by Mr. Gerrit S. Miller, Jr., presented the following measurements, taken from the fresh specimen: Length, 90 mm.; length of caudal vertebræ, 28; alar expanse 373; longest finger, 90; head, 17; forearm, 56.—*Edgar A. Mearns.*

**A Correction relative to the Tarsier.**

The specific name of the Tarsier is generally published as *tarsius*, but an examination of the original description (Erxleben, *Systema Regni Animalis*, p. 71, 1777), shows that *tarsier* is the original form. The correct combination is *Tarsius tarsier* (Erxleben).—*James A. G. Rehn.*

**An older Name for the Aard Vark.**

The name *Myrmecophaga afra* was applied by Pallas (*Miscellanea Zoologica*, p. 64, 1766) to the Aard Vark, as he calls the animal himself. As the description is as accurate as that of *capensis* Gmelin, it should unquestionably replace the latter. The combination should be *Orycteropus afra* (Pallas).—*James A. G. Rehn.*

**An older Name for the Ogotona.**

In 1776 Pallas (*Reise*, Th. iii, bd. 2, p. 692) applied the name *Lepus dauricus* to the Ogotona, and two years later he renamed the same animal *Lepus ogotona* (*Nov. Sp. Glir.*, p. 65, 1778). As we should accept the older name, the combination would be *Ochotona dauricus* (Pallas).—*James A. G. Rehn.*

**The proper Name of the Viscacha.**

In 1786 a German edition of Molina was published by Brandis, entitled 'Versuch einer Naturgeschichte von Chili'. On page 272 he applies the name *Lepus viscaccia* to 'La Viscacha' of Molina, and the description appended clearly shows that he had in view the same animal that Blainville called *Dipus marinus* in 1817. Mr. Gerrit S. Miller, Jr.,



who kindly examined a copy of Molina's 1776 edition for me, states that no binomial names are used in it. On this basis, the animal should be known as *Vizcacia viscaccia* (Brandis).—*James A. G. Rehn.*

#### An older Name for the Norway Rat.

Erxleben ('Systema Regni Animalis', p. 381, 1777), applied the name *Mus norvegicus* to the rat which was named *decumanus* by Pallas one year later: accordingly it should replace the latter name.—*James A. G. Rehn.*

#### On the recent Occurrence of the Black Rat in Boston, Massachusetts.

Under date of July 11, 1900, Mr. Frank Blake Webster, of Hyde Park, Mass., wrote me as follows: "About a year ago, a young man who lived in Boston said there were black rats in a store there. We had him obtain a specimen, which was mounted, and which we still have. During the many years that I have been engaged in business in the city of Boston I have never seen one". The specimen was sent to me and identified as *Mus rattus* by Doctor J. A. Allen and myself.—*Edgar A. Mearns.*

#### Note on *Dipodomys Montanus* Baird.

Among the mammal types treasured in the collection of the United States National Museum is the type of Baird's *Dipodomys montanus*, originally described in the Proceedings of the Philadelphia Academy of Natural Sciences, in 1855, but figured and more fully elaborated in that author's Mammals of North America, published in 1857. This well-marked species proves on comparison to be strictly identical with *Dipodomys elator* Merriam, named and described in the Proceedings of the Biological Society of Washington, in 1894, from specimens taken at Henrietta, Clay Co., Texas, about 450 miles southeast of Fort Massachusetts. The synonymy of *Dipodomys montanus* will therefore be as follows:

*Dipodomys montanus* Baird, Proc. Acad. Nat. Sci. Phila., April, 1855, p. 334 (Fort Massachusetts).

*Dipodomys ordii* var. *montanus* Baird, Mamm. North America, 1857, pp. 410, 411, 757, 762, pl. lxxxiii, fig. 4, *a, b, c* (teeth of type—No. 1438, a youngish adult). Type collected by Captain E. G. Beckwith, near Fort Massachusetts ("N. M.—On head of Rio Grande, in San Luis valley. Altitude, 8,365 feet. Latitude, 37° 32'; longitude, 105° 23'").

*Dipodomys elator* Merriam, Proc. Biol. Soc. Wash., Vol. ix, p. 100, June 21, 1894 (type from Henrietta, Clay Co., Texas).

*Edgar A. Mearns.*

**Remarks on an unusually large Marine Lobster caught off  
Newport, Rhode Island.**

I am indebted to Mr. Charles E. Ash, of Newport, for the opportunity of examining a lobster of unusually large size, taken off the island of Rhode Island, June 16, 1900, by a fisherman who was trawling for cod, using a line to which many hooks were attached. Lobster-pots are too small for the capture of very large lobsters. This one weighed 27 pounds, and ranks with the largest examples of its species. The crushing claw is on the left side. This lobster is normal and perfect in all its parts.

In the Bulletin of the American Museum of Natural History, N. Y., (Vol XII, pages 191-194, plate IX, published December 30, 1899), Professor R. P. Whitfield published a description and measurements of two phenomenally large lobsters, captured off Atlantic Highlands, New Jersey, during the spring of 1897. For convenience of comparison, I have followed the measurements of these two specimens, as taken by Doctor E. O. Hovey of the American Museum, presenting those of the present specimen in the third column (No. 3), Nos. 1 and 2 being those from New Jersey.

**MEASUREMENTS OF THREE LARGE LOBSTERS.**

	No. 1. mm.	No. 2. mm.	No. 3. mm.
Length of carapace, including rostrum, along median line.....	257	280	270
Circumference of carapace behind second pair of legs.....	268	486	493
Length of abdomen to point of telson .....	300	311	310
Breadth of tail.....	230	223	270
Large chelate limbs: right side, length of first two joints...	160	165	186
“ “ “ third joint.....	120	122	116
“ “ “ fourth joint.....	360	365	370
“ “ “ thumb.....	145	201	198
“ circumference of third joint .....	236	248	215
“ circumference of fourth joint.....	442	348	310
“ length of whole limb.....	570	610	525
left side, length of first two joints.....	171	183	186
“ “ “ third joint .....	118	124	109
“ “ “ fourth joint.....	360	375	360
“ “ “ thumb.....	198	155	162
“ “ “ whole limb.....	580	615	523
“ circumference of third joint .....	237	263	255
“ circumference of fourth joint .....	339	491	425
Entire length as mounted .....	920	1005	960

"Length of antennæ exceeds 400 mm."

"The right limb bears the crushing claw in No. 1, but the left limb bears it in No. 2. The weight of No. 1 when caught was said to be 31 pounds; that of No. 2 was said to be 34 pounds."

In No. 3 (from Newport), the antennæ measured 550 mm. in length. Distance from rostrum to end of tail, 555. Greatest expanse of chelate limbs, 1025.

Mr. Charles E. Ash has presented this specimen to the United States National Museum, at Washington.—*Edgar A. Mearns*.

#### A new southern Violet.\*

##### *Viola Alabamensis* Pollard, n. sp.

Acaulescent, of dwarf and spreading habit, from slender nearly vertical rootstocks: leaves small, sparingly hirsute, the blade cordate, sub-orbicular, 1.5 to 2 cm. in length, the slender petiole as long or twice as long; flowering scapes greatly exceeding the foliage (7 to 8 cm. long) the flower purple, 2.5 cm. in diameter; petals broadly oblong, the margins obscurely crose or fimbriate; sepals small, ovate-lanceolate; cleistogamous flowers and fruit not observed.

Type in the herbarium of Dr. Charles Mohr, collected by Dr. Denny at Sucksville, Washington County, Alabama, in 1852. Specimens collected by Dr. Mohr himself at Cullman, Alabama, March 22, 1889, are obviously also to be referred here. The habitat is stated by Dr. Mohr to be "dry open copses" and the plant is evidently confined to the upland portions of the state. Though related to *V. villosa* Walt., and *V. caroliniana* Greene it suggests neither in habit or floral characters.—*Charles Louis Pollard*.

#### The correct name for the eastern form of the Fox Squirrel

(*Sciurus ludovicianus*).

In the Annals and Magazine of Natural History for 1867 (3d ser., xx, p. 425), Dr. J. E. Gray described *Macrourus neglectus* based on the skin of a female in the British Museum. The habitat was given as 'North America' and Dr. Gray added to the imperfect description the remarks that it was 'A heavy animal as large as *Sc. vulpinus* and *Sc. cinereus*, very like the latter,' &c.

While preparing my 'Revision of the Squirrels of Mexico and Central

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*rostris* of Colombia. Here the incisors were absent in about one-third of the individuals, and the full set was present in less than one-half.\*

***Mormoops intermedia* sp. nov.**

*Type* adult female (in alcohol) No. 102,174 United States National Museum, collected in cave at Hatto, on north coast of Curaçao, West Indies, April 29, 1900.

*Characters*.—Similar to the Mexican *Mormoops megalophylla* Peters, but smaller, the size intermediate between that of the two previously known species: color (at least in brown phase) slightly darker than in *M. megalophylla*.

*Color*.—Brown phase: entire dorsal surface sepia, the fur paler beneath the surface, and each hair tipped with light drab. The drab tips produce a distinct 'bloom' in certain lights. Underparts very pale yellowish broccoli-brown, lightest on belly, flanks and pubic region, faintly darker across chest. Red phase: like brown phase but entire pelage suffused with cinnamon. Pale phase: light salmon-buff above and below, becoming more red about shoulders and head. Ears and membranes dark brown in all three color phases. Individuals in the brown phase are the most frequent: those in the red phase are less often met with; while the pale phase is comparatively rare.

*Membranes, ears*, and other external characters as in *Mormoops megalophylla*.

*Skull and teeth*.—While the skull exactly resembles that of *Mormoops megalophylla* the teeth are distinguishable by the greater size and consequent crowding of the upper premolars. The anterior premolar is distinctly broader than in *M. megalophylla* and it usually fills the entire space between canine and posterior premolar. The lower premolars are slightly larger than in the Mexican animal.

*Measurements*.—External measurements of type specimen: total length, 80; tail, 20; tibia, 20; foot, 9; calcar, 20; forearm, 48; thumb, 6.4; second digit, 45; third digit, 90; fourth digit, 6.6; fifth digit, 57; ear from meatus, 14; ear from crown, 9. Average of twenty topotypes: tail, 20.9 (18-22); forearm, 49.6 (48-51).†

*Specimens examined*.—One hundred and sixty-four from caves and rock crevices in all parts of the island.

*Remarks*.—*Mormoops intermedia* is readily distinguishable from *M. megalophylla* by its size and more crowded upper premolars. With the Jamaican *M. blainvillii* it needs no comparison. The color phases in this bat are very striking.

***Natalus tumidirostris* sp. nov.**

*Type* adult male (in alcohol) No. 102,106 United States National Museum, collected in cave at Hatto, on north side of island of Curaçao, West Indies, May 1, 1900.

\*Bull. Am. Mus. Nat. Hist., N. Y., xiii, p. 89, May 12, 1900.

†Average of twenty specimens of *M. megalophylla* from Mirador, Vera Cruz, Mexico: tail, 27.8 (26-32); forearm, 54 (53-57).

*Characters.* Externally similar to Mexican specimens of *Natalus stramineus* Gray, but fingers shorter and ears somewhat more pointed. Skull with braincase more abruptly elevated than in the Mexican species, and *rostrum conspicuously inflated at sides*. Teeth throughout larger than in *N. stramineus*, the lower premolars noticeably broadened.

*Color.*—Dorsal surface uniform cream-buff, the tips of the hairs gradually darkening to pale drab; belly similar, but the buff slightly more tinged with yellow and the drab less apparent. Ears and membranes light brown.

*Ears.*—The ear is essentially as in *N. stramineus*, but the point is distinctly longer and narrower.

*Membranes, feet,* and other external characters as in *N. stramineus*.

*Skull.*—Though in general appearance the skull of *Natalus tumidirostris* resembles that of *N. stramineus* it is immediately distinguishable by the conspicuously swollen sides of the rostrum. The inflation involves the maxillary bones from anterior edge of orbit almost to nares, and from near edge of toothrow to nasals. As the nasals retain the normal form they appear to occupy the floor of a broad, shallow, longitudinal groove. In the type the braincase rises above the dorsal plane of the rostrum at an angle of  $50^{\circ}$ , in a second specimen at an angle of  $58^{\circ}$ . In two specimens of *N. stramineus* the angle is respectively  $34^{\circ}$  and  $40^{\circ}$ . In both specimens of *Natalus tumidirostris* the bony palate terminates on each side at the plane of the postero-internal angle of the crown of the second molar. In the median line it is continued slightly further back along palatal face of vomer. The resulting form is strikingly different from that of the palate in other members of the genus. It is possible, however, that the palate is normal and that its peculiarity in the two specimens is the result of injury. As both skulls were cleaned by an experienced preparator there seems little probability that the palate was originally of the usual form.

*Teeth.*—The dentition is throughout heavier than in *N. stramineus*, and the form of the individual teeth differs in many important details. Canines and incisors as in *N. stramineus*. Relative size of upper premolars as in *N. stramineus*, that is the crown area decreasing regularly from third to first, the latter equal to about one-half former, but cusp of first slightly longer than that of second. In each tooth the transverse diameter is greater relatively to the longitudinal diameter than in the Mexican animal. Upper molars broader than in *N. stramineus*, the posterior commissure of protocone of first and second *distinctly marked by a rudimentary hypocone*. The lower premolars and molars differ from those of *N. stramineus* in greater breadth of crown, this character especially noticeable in the second and third premolars.

*Measurements.*—External measurements of type (♂) and paratype (♀): total length, ♂ 96, ♀ 94; tail, ♂ 47, ♀ 45; tibia, ♂ 18.4, ♀ 17.6; foot, ♂ 7, ♀ 8; forearm, ♂ 36, ♀ 35; thumb, ♂ 5, ♀ 4.8; second digit, ♂ 35, ♀ 35; third digit, ♂ 72, ♀ 69; fourth digit, ♂ 52, ♀ 50; fifth digit, ♂ 51, ♀ 49; ear from meatus, ♂ 15.4, ♀ 15.4; ear from crown ♂ 11.4, ♀ 12.

rection of surface exposure, of springs and small streams, of sandstone and limestone cliff and talus formations, of vast forest tracts not until the present falling to the axe, and of occasional stretches, narrow to be sure, of bottom-land along the larger streams. The great impression is that of many mountains for the most part well timbered. The impression from minute characters is that there is a constant supply of moisture. Although the Summer of 1900 was so dry that many springs and streams reputed to be constant went dry, the mountains not yet deforested were covered with a rich, moist humus; the rocks were hidden under mosses and lichens till the surface looked like a vast tapestry; the fields and open hillsides, exposed to the sun, supported everywhere between the stems and roots of higher plants a filling of mosses and liverworts. These conditions are traceable to the nightly enveloping of every summit and the filling of every valley with clouds.

In making the following records and collections, the writer practically was limited by other requirements to the country immediately adjacent to the roads traversed from camp to camp, along a few of the streams, and to only three summits of mountains. Mr. Wm. R. Maxon of the National Herbarium has kindly determined and described as new a subspecies of *Polypodium*.

The object of publishing this list, containing forty-seven species unreported from West Virginia, and two new subspecies is to show the need of very active collecting in the extreme southern part of the State to approximately complete the knowledge of its flora.\*

#### Thallophyta.

##### Myxomycetes.

CERATIOMYXA FRUTICULOSA (Muell.) MacB. (Determined by O. F. Cook.)

Along Delashmeet Creek, Mercer County, altitude 2090 feet, July 25, 1900 (*Morris*, 946).

PHYSARUM RUFIPES (A. & S.) Morgan. (Determined by O. F. Cook.)

Along Tugg Creek, Hinton, Summers County, July 10, 1900 (*Morris*, 945).

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\*Consult Millspaugh and Nuttall, Field Columbian Museum Publication 9. Bot. Ser. 1, 2 (Flora of West Virginia), 1896.

STEMONITIS SMITHII MacB. (Determined by MacBride.)

As the first (*Morris*, 949).

LYCOGALA CONICUM Pers. (Determined by O. F. Cook.)

As above (*Morris*, 947).

Lycoperdaceae.

GEASTER HYGROMETRICUS Pers.

Along Horsepen Creek, McDowell County, July 30-August 1,  
1900 (*Morris*, 1105a).

Ascomycetes.

DIMEROSPORIUM COLLINSII (S.) Thüm.

On *Carpinus Caroliniana*, Kegley, Mercer County, July 27, 1900  
(*Morris*, 1078).

Discolichenes.

CLADONIA SYLVESTRIS L.

On the mountain between Barrenshe Creek and Dry Fork,  
McDowell County, altitude 1700 feet, August 6, 1900 (*Morris*,  
1163).

Bryophyta.

Jungermanniaceae. (Determined by M. A. Howe.)

LEJEUNEA LUCENS Tayl.

On dripping limestone along Horsepen Creek between McDowell  
County, West Virginia, and Tazewell County, Virginia, alti-  
tude 1850 feet, July 31, 1900 (*Morris*, 1116b).

Anthoceraceae.

ANTHOCEROS LAEVIS L.

On dripping limestone along the Guyandot River below Baileys-  
ville, Wyoming County, altitude 1200 feet, August 15, 1900  
(*Morris*, 1221).

Bryaceae. (Determined by Mrs. E. G. Britton.)

DICRANUM DRUMMONDII Muell.

On the mountain between Barrenshe Creek and Dry Fork, Mc-  
Dowell County, altitude 1700 feet, August 6, 1900 (*Morris*,  
1163).

BRYUM ROSEUM Schreb.

Along Horsepen Creek, McDowell County, July 31, 1900 (*Mor-  
ris*, 1119).

POGONATUM BREVICAULE Beauv.

North slopes on Road Run, Wyoming County, August 12, 1900  
(*Morris*, 1176).

RHYNCHOSTEGIUM RUSCIFORME B. & S.

See under *Bryum roseum* (*Morris*, 1117).

## Pteridophyta.

## Polypodiaceae.

*Polypodium vulgare oreophilum* Maxon, subsp. nov.\*

Rhizoma slender, extensively creeping, covered thickly with spreading chaff; stipe 5 to 8 inches long, greenish to stramineous; laminae very dark green above, lighter below, 7 to 11 inches long,  $2\frac{1}{2}$  to 4 inches broad; pinnae distant from once to twice their width, broadest in the middle and tapering to an acute apex, the margin doubly crenate or occasionally nearly entire, the base broadly decurrent, veins sinuous and prominent in drying, the veinlets usually forking twice; tip of lamina long acuminate, as in *P. falcatum*; sori very large, often irregularly disposed.

Type in the U. S. National Herbarium, Smithsonian Institution, collected by E. L. Morris, No. 1215, on rocks, along the Guyandot River below Baileysville, Wyoming County, W. Va., alt. 1100-1250 feet, August 13-19, 1900. This fern has already been briefly characterized† by Dr. Millspaugh as *Polypodium vulgare* forma *biserrata* (sic). The name *biserratum* being already preoccupied by a Mexican fern‡ it becomes necessary, in referring to the West Virginian plant, to substitute a new name. In addition I would refer here Mr. Morris' 1207 collected near the type station; also Pollard & Maxon's No. 25, collected Aug. 21, 1899, at Quinmimont, W. Va., which I have previously referred§ tentatively to the variety *acutum* Moore§. From *acutum* it differs in the narrower and more spatulate pinnae, and commonly in the double crenation, for *acutum* is normally with entire, or at most slightly serrulate, pinnae. Mr. Morris states that typical *vulgare* was common in the general region; from this it differs in its much greater size, its scantier foliage, and in the shape of the pinnae. There are in the National Herbarium at least two specimens, collected in West Virginia and North Carolina, which with plants collected at Great Falls, Fairfax County, Va., by William Palmer, are to be regarded as intermediate with typical *vulgare*. Because of these it does not seem best to regard *oreophilum* as entitled to specific rank.

## Selaginellaceae.

## SELAGINELLA APUS (L.) Spring.

In a luxuriant mass among the grass and shrubs along the edge

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†Bull. 24, W. Va. Exp. Sta., p. 479. 1892.

‡*Polypodium biserratum* M. & G. Mem. Foug. Mex. p. 38. 1842.

§Fern Bull. 8: 58. 1900.

§Moore, Nat. Pr. Brit. Ferns, 1: 63, pl. II, fig. a. 1859.



of an island in the Bluestone River, opposite Delashmeet Creek, Mercer County, altitude 2080 feet, July 27, 1900 (*Morris*, 1061).

**Spermatophyta.**

**Pinaceae.**

*Tsuga Canadensis* (L.) Carr.

This species with *Fagus Americana*, *Quercus nigra* and *Quercus alba* form the body of the mountain forests.

**Naiadaceae.**

*POTAMOGETON PECTINATUS* L. (Determined by F. V. Coville.)

Forming large masses on the bars of the Greenbrier River at Talcott, Summers County, altitude 1490 feet, August 24, 1900 (*Morris*, 1342).

**Vallisneriaceae.**

*VALLISNERIA SPIRALIS* L.

Among the pondweeds in the Greenbrier River at Talcott, Summers County, altitude 1490 feet, August 24, 1900 (*Morris*, 1341).

**Gramineae.** (Determined by Messrs. Ball and Merrill.)

*PASPALUM LAEVE PILOSUM* Scribn.

Along Horse and Hound Creeks, near Baileysville, Wyoming County, altitude 1100-1200 feet, August 20, 1900 (*Morris*, 1284).

*PANICUM ELONGATUM* Pursh.

At the edge of thickets along Horse and Hound Creeks, near Baileysville, Wyoming County, altitude 1100-1200 feet, August 20, 1900 (*Morris*, 1277).

*PANICUM COMMUTATUM* Schult.

In a woodland near Bangers Spring, Summers County, altitude 1500 feet, July 13, 1900 (*Morris*, 977).

*PANICUM POLYANTHER* Schult.

Shaded banks of the Guyandot River below-Baileysville, Wyoming County, altitude 1100 feet, August 13, 1900 (*Morris*, 1186).

*PANICUM NITIDUM* Lam.

Along the edge of a meadow at Bangers Spring, Summers County, altitude 1500 feet, July 13, 1900 (*Morris*, 984).

*PANICUM BARBULATUM* Michx.

Along Dry Fork above Perryville, McDowell County, altitude 1200-1300 feet, August 4, 1900 (*Morris*, 1139); along the Guyandot River below Baileysville, Wyoming County, altitude 1100 feet, August 13, 1900 (*Morris*, 1193).

*AGROSTIS CANINA* L.

On shaded banks of the Guyandot River below Baileysville,

Wyoming County, altitude 1100 feet, August 13, 1900 (*Morris*, 1197).

*AGROSTIS CAPILLARIS* L.

As the preceding (1197a).

Cyperaceae.

*CYPERUS RETROFRACTUS* (L.) Torr.

Along the Guyandot River below Baileysville, Wyoming County, altitude 1100 feet, August 18, 1900 (*Morris*, 1236a).

*CYPERUS FILICULMIS* Vahl.

As the preceding, August 19, 1900 (*Morris*, 1267).

*CAREX UTRICULATA* Boott.

In a meadow at Bargers Spring, Summers County, altitude 1500 feet, July 13, 1900 (*Morris*, 995).

Melanthaceae.

*UVULARIA GRANDIFLORA* J. E. Smith.

On a north slope in rich woods along Horsepen Creek between McDowell County, West Virginia, and Tazewell County, Virginia, altitude 1900 feet, July 31, 1900 (*Morris*, 1110).

Betulaceae.

*Betula nigra* L.

A tree 14' 2½" in circumference was measured near Bargers Spring, Summers County.

Fagaceae.

*Fagus Americana* Sweet.

(See under *Tsuga Canadensis*.)

*Castanea pumila* (L.) Mill.

A remarkably spreading and symmetrical individual was observed in a pasture at Bargers Spring, Summers County.

*Quercus nigra* L.

(See under *Tsuga Canadensis*.)

*Quercus alba* L.

(See under *Tsuga Canadensis*.)

Aristolochiaceae.

*ASARUM SHUTTLEWORTHII* Britten & Baker f. (Determined by C. L. Pollard.)

In oak and beech woods near Bargers Spring, Summers County, altitude 1550 feet, July 13, 1900 (*Morris*, 980).

Polygonaceae.

*POLYGONUM CRISTATUM* Engelm. & Gray.

Along the Guyandot River below Baileysville, Wyoming County, altitude 1100-1250 feet, August 19, 1900 (*Morris*, 1255).

Caryophyllaceae.

*Silene Virginica* L.

Growing on a low roadside bank, fully exposed to the sun, but well supplied with root moisture.

*Anychia dichotoma* Michx.

Millsbaugh & Nuttall say "This species first appeared at this locality in 1805, at the bottom of a newly excavated railroad cut. Had the seeds been buried and dormant?" I should say, no. This species was common with and nearly as abundant as the next throughout the above mentioned counties. It is probable that the newly excavated cut proved, perhaps unusually, suitable for the germination of scattering seeds.

*Anychia Canadensis* (L.) B. S. P.

Magnoliaceae.

*Magnolia tripetala* L.

This and the next species form a very conspicuous part of the forests along Dry Fork and Crane Creek in McDowell County, and along the Guyandot River in Wyoming County. A great many young trees are now filling the places made vacant by the cutting of a few selected trees of other species. It is noticeable that until these trees reach the age of flowering and thereafter there is none of the characteristic umbrella-like clustering of the leaves on the axis of the season but they are strongly alternate and distant. This character confuses the species with *Magnolia acuminata* in the young large-leaved stage, unless the smoothness or pubescence of the leaf-buds be noted.

Podostemaceae.

PODOSTEMON CERATOPHYLLUM Michx.

Three well marked stages, (a) an entirely sessile growth on new surfaces, (b) matted growth of previous seasons on old surfaces, with stems an inch or two high, (c) very old masses with stems from five to eight inches high or as long where the current prevented an erect habit; in the Guyandot River below Baileysville, Wyoming County, altitude 1100 feet, August 15, 1900 (Morris, 1210).

Crassulaceae.

*Penthorum sedoides* L.

Very luxuriant specimens three feet and more high were noted in the delta of a spring under limestone cliffs below Baileysville, Wyoming County.

Rosaceae.

*Spiraea salicifolia* L.

Forming a hedge along a woodland swamp between Harvey and Trap Hill, Raleigh County.

**GEUM FLAVUM** (Porter) Bicknell.

Along Madam Creek opposite Hinton, Summers County, altitude 1500 feet, July 9, 1900 (*Morris*, 965); along the Guyandot River below Baileysville, Wyoming County, altitude 1250 feet, August 15, 1900 (*Morris*, 1218).

**AGRIMONIA HIRSUTA** (Muhl.) Bicknell.

In a thicket about a spring near Kegley, Mercer County, altitude 2100 feet, July 21, 1900 (*Morris*, 1042).

**Drupaceae.****AMYGDALUS PERSICA** L.

Several trees were growing in the woods along Dry Fork above Peeryville, McDowell County, altitude 1300 feet, August 4, 1900 (*Morris*, 1130).

**Papilionaceae.****MEIBOMIA PAUCIFLORA** (Nutt.) Kuntze.

In woods along Laurel Branch east of Oceana, Wyoming County, altitude 2000 feet, August 22, 1900 (*Morris*, 1291).

*Meibomia Dillenii* (Darl.) Kuntze.

Locally a very troublesome weed in fields.

**Hippocastanaceae.***Æsculus octandra* Marsh.

An immense tree of this species, measuring twenty feet in circumference at the ground, twelve feet at the height of one's shoulder, and nearly if not quite one hundred feet high, stood by the bank of Dry Fork above Peeryville, McDowell County.

**Violaceae.** (Determined by C. L. Pollard.)**VIOLA AFFINIS** LeConte.

About a spring near Kegley, Mercer County, altitude 2000 feet, July 21, 1900 (*Morris*, 1046).

**VIOLA PAPILIONACEA** Pursh.

On Great Bend Tunnel Mountain, Summers County, altitude 1700 feet, July 14, 1900 (*Morris*, 1023); along Horsepen Creek, McDowell County, altitude 1900 feet, July 30, 1900 (*Morris*, 1104).

**VIOLA ALSOPHILA** Greene.

As the last number (*Morris*, 1101); ditto, altitude 1850 feet, (*Morris*, 1109).

**Umbelliferae.****SANICULA TRIFOLIATA** Bicknell.

Along Madam Creek opposite Hinton, Summers County, altitude 1500 feet, July 9, 1900 (*Morris*, 961).

**Cuscutaceae.****CUSCUTA ARVENSIS** Beyrich.

On *Ambrosia artemisiæfolia* in very dry grounds below Baileys-

ville, Wyoming County, altitude 1150 feet, August 13-19, 1900 (*Morris*, 1203a).

**Boraginaceae.**

*MYOSOTIS LAXA* Lehm.

About a spring near Kegley, Mercer County, altitude 2090 feet, July 21, 1900 (*Morris*, 1041).

**Labiatae.**

*BLEPHILIA CILIATA* (L.) Raf.

On dry banks at Bargers Spring, Summers County, altitude 1500 feet, July 13, 1900 (*Morris*, 999); thickets near Kegley, Mercer County, altitude 2100 feet, July 27, 1900 (*Morris*, 1067).

**Solanaceae.**

*Solanum Carolinense* L.

This species and *Verbesina occidentalis* were the commonest weeds throughout the range.

**Plantaginaceae.**

*PLANTAGO ARISTATA* Michx.

Previously reported only by State in Bull. Torr. Bot. Club, 27: 108.

Dry meadows near Bargers Spring, Summers County, altitude 1500 feet, July 13, 1900 (*Morris*, 983).

**Campanulaceae.**

*Campanula divaricata* Michx.

Millsbaugh & Nuttall mention "the rare *Campanula divaricata* Mx." among the bell-worts or bellflowers. If the southern counties are to be taken into consideration in rating the occurrence of species in the State, then this species can not be accounted "rare" for the more rocky hillsides throughout are heavily blue-dotted in the Summer with its delicate panicles.

**Compositae.**

*Vernonia gigantea pubescens* subsp. nov.

In gross characters like the species. Reaching 10° or over, more or less pubescent. Leaves thin, lanceolate, acuminate, the upper finely, the lower *sharply doubly serrate*, 3'-12' long, 1'-2½' wide, *finely pubescent below*, somewhat so above; inflorescence open, its branches rather erect, the peduncles *bracteate for 2''-5'' below the heads*; the heads long-peduncled or the centre ones nearly sessile; the bracts greenish purple, acute to short-acuminate, ciliate, erect; corollas light to dark pink, not purple; otherwise as in the species.

Collected among plants of the species along Hound Creek, below Baileysville, Wyoming County, altitude 1100-1200 feet, August 20, 1900 (*Morris*, 1274). Type specimen is deposited in the U. S. National Herbarium.

*Eupatorium purpureum* L.

Numerous specimens were measured which were over twelve feet high.

*SERICOCARPUS LINIFOLIUS* (L.) B. S. P.

On dry shaded banks along the road above Hinton, Summers County, altitude 1400 feet, July 7, 1900 (*Morris*, 930).

*ASTER CLAYTONI* Burgess.

Along rocky banks east of Oceana, Wyoming County, altitude 1300 feet, August 22, 1900 (*Morris*, 1294a).

*ASTER SAGITTIFOLIUS* Willd.

On dry banks between Piney, Raleigh County, and Jumping Branch, Summers County, altitude 2200-3100 feet, August 24, 1900 (*Morris*, 1338).

*GIFOLA GERMANICA* (L.) Dumort.

Along the road north of Athens, Mercer County, altitude 2500 feet, July 18, 1900 (*Morris*, 1031).

In preparing this paper the arrangement of the Myxomycetes is according to McBride; the remaining Thallophytes according to Engler & Prantl; the hepatic Bryophytes according to Millspaugh & Nuttall; the true mosses according to Lesquereux & James; the Pteridophytes and Spermatophytes according to Britton & Brown.

Strong heliotropic movements were observed almost daily in various species of *Oxalis*, in *Cercis Canadensis*, *Trofolium dubium* (?), *Vitis cordifolia*, *Robinia hispida* (?), and questionably in *Impatiens aurea*. These species are quoted in the order of those with the greatest movement to those with the least.

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Professor C. F. Millspaugh has requested that the following additions be published in this paper, so that the report of species new to West Virginia may be as complete as possible. It is a pleasure to so publish his list.

## Fungi.

*PERICHAENA FLAVIDA* Pk.

On bark of dead *Magnolia Fraseri*, Nuttallburg.—L. W. Nuttall.

*ZYGODESMUS TILIACEUS* E. & E.

On bark of dead *Magnolia Fraseri*, Nuttallburg.—L. W. Nuttall.

*CLADOSPORIUM CORYNITRICHUM* E. & E.

On leaves of *Magnolia Fraseri*, Nuttallburg.—L. W. Nuttall.

*CLASTERISPORIUM SIGMOIDEUM*, E. & E.

Bull. Torr. Club, **26**:472. 1897.

*HELMINTHOSPORIUM FUSIFORME* Corda.

On old barrel staves, Nuttallburg.—L. W. Nuttall.

*FUSARIUM ALEURINUM* E. & E.

Bull. Torr. Club, **24**:476. 1897.

*FUSARIUM OXYDENDRI* E. & E.

Ibid page 477.

*PHYLLOSTICTA ALTHAEINA* Sacc.

On *Abutilon Avicennae*, Nuttallburg.—L. W. Nuttall.

*FUSICOCUM NERVICOLUM* E. & E.

Bull. Torr. Club, **25**:609. 1898.

*CYTISPORA TUMULOSA* E. & E.

Bull. Torr. Club, **24**:288. 1897.

*CYTISPORELLA CARNEA* E. & E.

Ibid page 287.

*DIPLODIA PARAPHYSATA* E. & E.

Ibid page 288.

*AECIDIUM ILICINUM* E. & E.

Ibid page 284.

*SPHAERELLA INFUSCANS* E. & E.

Bull. Torr. Club, **25**:504. 1898.

#### Filices.

*ASPLENIUM FILIX-FORMINA PECTINATUM* Wall.

Falls of the Blackwater.—C. F. Millsbaugh.

#### Phanerogamia.

*LOLIUM ITALICUM* A. Br.

Common on lawns in Fairmont, 1898.—A. Boutlou.

*ORNITHOGALUM NUTANS* L.

In a ravine above the glass factory north of Morgantown.—A. Boutlou.

*POTENTILLA RECTA* L.

"I find this plant growing in abundance in a meadow near South Fairmont."—A. Boutlou.

*AGRIMONIA BRITTONIANA* Bick.

Bull. Torr. Club, **23**:517. 1896.

*ROSA SETIGERA* Michx.

A common escape about Fairmont.—A. Boutlou.

*CRATAEGUS BROWNII* Britt.

Bull. N. Y. Bot. Gard., **1**:447. 1900.

KNEIFFIA LONGIPEDICELLATA Small.

Bull. Tor. Club, **23**:178. 1896.

VACCINIUM CONSTABLAEI Gray.

Upshur Co.—W. N. Pollock.

SABBATIA CORYMBOSA Baldw.

Found at West Fairmont.—A. Boutlou.

AMPELANUS ALBIDUS (Nutt.) Britton.

An abundant weed about Charleston.—A. Boutlou.

PHLOX BRITTONII Small.

Bull, Torr. Club, **27**:279. 1900.

MEEHANIA CORDATA (Nutt.) Britton.

Upshur Co.—W. N. Pollock.

PLANTAGO ARISTATA Michx.

Plentiful near Farmington.—A. Boutlou. (Mr. Boutlou's specimens are those referred to in the citation under *P. aristata* above. [E. L. M.] )

VERNONIA MAXIMA Small.

Bull. Torr. Club, **27**:280. 1900.

SOLIDAGO NEGLECTA T. & G.

Upshur Co.—W. N. Pollock.

ASTER NOVAE-ANGLIAE L.

Near Palatine, and near Fairmont.—A. Boutlou.

ANTENNARIA PROPINQUA Greene.

Pittonia, **4**:83. 1899.

BIDENS MELANOCARPA Wieg.

Bull. Torr. Club, **26**:407. 1899.

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*Department of Biology, Washington High Schools.*



PROCEEDINGS  
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GENERAL NOTES.

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**New name for a North American Squirrel.**

In 1891 I described a subspecies of Abert's squirrel under the name of *Sciurus aberti concolor*.\* My attention has recently been called to the fact that an Asiatic squirrel was given the specific name *concolor* by Blyth in 1855.† In order to prevent confusion I would propose that the sub-specific name of the American animal be changed to *ferreus*.—F. W. True.

**The proper name of the Viscacha.**

In 1897 Dr. T. S. Palmer (*Science*, N. S., VI, No. 131, pp. 21, 22, July 2, 1897) called attention to the fact that the then current generic name of the Viscacha, *Lagotomus* Brookes (1828) was antedated by *Vizcacia* Schinz (circa 1825), and that the specific name *trichodactylus* Brookes (1828) was antedated by *maximus* (*Dipus maximus* Desmarest, ex Blainville, Ms., 1817,) and therefore claimed that the proper name of the Viscacha was "*Vizcacia maxima* (Blainville)." Recently Mr. James A. G. Rehn (Proc. Biol. Soc. Wash., XIII, p. 166, Oct. 31, 1900) states that the specific name *maxima* is antedated by *Lepus viscaccia* Brandis (Ver-

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\*Proc. U. S. Nat. Mus., 17, 1894, No. 999, pp. (advance sheet issued April 26, 1894).

†Jour. Asiatic Soc. Bengal, new series, 24, No. 5, 1855, p. 474, footnote.

such einer Naturgeschichte von Chili, 1786, p. 272), overlooking the fact that this latter name originated with Molina, it appearing in the first (1782) edition of his 'Saggio sulla Storia Naturale del Chili,' p. 342, as *Lepus viscacia*. The name of the Viscacha should therefore be *Viscacia viscacia* (Molina). The authority for the specific name is hence Molina and not Brandis, and the name itself takes the form *viscacia* instead of *viscaccia*.—J. A. Allen.

#### A new *Helianthus* from Florida.\*

##### *Helianthus agrestis* Pollard, n. sp.

Annual, rather freely branching, about one meter in height; stem many-striate or even sulcate, for the most part quite glabrous; peduncles slender, 1-flowered, hoary-pubescent near the heads, the pubescence gradually thinning below to a few scattered hairs; lower cauline leaves lanceolate, acuminate, 1.5 dm. long, tapering below to a short margined petiole, the margins remotely denticulate, hispid with short bristly hairs; blade with a prominent central nerve and two laterals springing from some distance above the base, both surfaces glabrous except along the primary nerve beneath; heads 5 to 6 cm. in diameter, the rays about 10 to 12, bright orange-yellow; involucre bracts lanceolate, attenuate, slightly scabrous, the margins sparsely ciliate; achenes narrowly oblong.

Type in the United States National Herbarium, Smithsonian Institution, (sheets Nos. 370175 and 370176) collected on shelly land between Lake Beresford and the St. Johns River, Volusia County, Florida, July 12, 1900, by A. H. Curtiss. The collector observes that the plant is tender and rather succulent, an unusual character among the species of *Helianthus*.

The new species had been previously collected by A. P. Garber in Levy and Manatee Counties in 1877. Mr. Merritt L. Fernald, of the Gray Herbarium, who had independently reached the conclusion that the plant was undescribed, courteously placed at my disposal the notes he had prepared, from which I quote the following: "Mr. Garber's plant was included by Dr. Gray in his *H. Floridanus*, but it is very distinct from that perennial species, which must rest upon Palmer's plant No. 283 of the 1874 collection, first cited by Dr. Gray,—a plant well matched by other specimens from Chapman and Curtiss, No. 1437."—Charles Louis Pollard.

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A NEW MOUSE DEER FROM LOWER SIAM.\*

BY GERRIT S. MILLER, JR.

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The large *Tragulus* of the *napu* type inhabiting Trong, Lower Siam, differs notably from the Sumatran animal as described by F. Cuvier and as represented by a specimen from Linga Island, off the east coast of Sumatra. As none of the names based on continental specimens appear to be applicable to it, the species may be known as:

*Tragulus canescens* sp. nov.

*Type*.—Adult female (skin and skull) No. 83,509, United States National Museum. Collected in Trong, Lower Siam, September 7, 1896 by Dr. W. L. Abbott.

*Characters*.—Larger than *Tragulus napu* and much paler, less yellow in color; chest and belly entirely white, or at most the former very faintly shaded with gray along median line; sides clear gray; dark nape band obsolete.

*Color*.—Back orange-buff heavily clouded with blackish brown, but latter color never in excess of former. On sides the orange-buff fades abruptly through cream-buff to nearly white, producing with the blackish tips of the hairs a clear gray, faintly yellowish, strongly contrasted with color of back. Flanks more tinged with buff than sides. Harsh fur of shoulders, neck and nape irregularly and coarsely grizzled with

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cream-buff and blackish brown, the latter slightly in excess on nape, but not forming a distinct median stripe. Upper surface of head and face essentially like back. A faint, diffuse, pale streak over and in front of eye. Sides of neck slightly paler than nape. Throat with the usual dark and white bands, all of which are of approximately equal breadth. The dark bands are darker than the neck, but not conspicuously so. They are coarsely grizzled with buff and blackish brown, the latter color in excess. Collar like sides, therefore paler than longitudinal throat bands. Chest, belly and inner side of legs white, the chest faintly shaded with gray along median line. Outer surface of legs clear orange-buff, somewhat brighter than that of back. Tail white beneath, orange-buff faintly clouded with blackish brown above.

*Skull and teeth.*—In size and general form the skull of *Tragulus canescens* closely resembles that of *T. napu*. It is at once distinguishable, however, by the larger audital bullæ and much larger teeth. When the skulls are viewed from behind, held so that the tips of the premaxillaries fall in line with the anterior rim of the foramen magnum the visible surface of each audital bulla is reduced in *Tragulus napu* to a mere rim much less extensive than that of the occipital condyle, while in *T. canescens* the bulla appears considerably larger than the condyle. The actual difference in size is about as follows: *Tragulus napu*; greatest length of bulla, 23; greatest width, 12.4; *Tragulus canescens*; greatest length of bulla, 25; greatest width, 14. Though not different in form, the teeth of *Tragulus canescens* are uniformly larger than those of *T. napu*, so that each toothrow is about 5 mm. longer.

*Measurements.*—External measurements of type: total length, 648; head and body, 559 (553\*); tail vertebræ, 89; hind foot, 152 (120); hind foot without hoof, 136 (105); ear from meatus, 37 (34); ear from crown, 35 (30); width of ear, 21 (22).

Cranial measurements of type: greatest length 115 (114\*); basal length, 110 (106); basilar length, 103 (99); occipito-nasal length, 104 (104); length of nasals, 36.4 (34); diastema, 14 (15); zygomatic breadth, 50 (48); least interorbital breadth, 31 (30); mandible, 90 (90); maxillary toothrow (alveoli), 40 (34); mandibular toothrow (alveoli), 46 (39.6).

*Weight.*—Weight of type, 5.33 kg. Weight of a second specimen (adult female), 5 kg.

*Specimens examined.*—Three, all from the type locality.

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\*Measurements in parenthesis are those of an adult female *Tragulus napu* from Linga Island.

PROCEEDINGS  
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MAMMALS COLLECTED BY DR. W. L. ABBOTT  
ON PULO LANKAWI AND THE  
BUTANG ISLANDS.\*

BY GERRIT S. MILLER, JR.

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The first half of December, 1899 Dr. W. L. Abbott spent in exploring Pulo Lankawi and the Butang Islands. Pulo Lankawi, or as it stands on some maps, Langkawi, or Lancava, and the Butang or Buton Islands are situated near the west coast of the Malay Peninsula at the northern extremity of the Straits of Malacca, about 75 miles north of Penang. Lankawi is separated from the mainland by ten miles or more of water, the Butangs by a space about double as great. The distance from the western end of Lankawi to the Butang group is about fifteen miles in a northwesterly direction. The collection of mammals, numbering about eighty specimens, all of which have been presented to the United States National Museum, represents thirteen species, of which all are closely related to those of the adjacent mainland.

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*Mus vociferans lancavensis* subsp. nov.

*Type*.—Adult female (skin and skull), No. 104,173 United States National Museum. Collected on Pulo Lankawi, December 6, 1899. Original number 122.

*Character*.—Not as large as *Mus vociferans vociferans* from Trong, Lower Siam; color more conspicuously ochraceous; tail with less brown on dorsal surface; skull with median portion of parietals more elevated above general outline of braincase.

*Color*.—The color so closely resembles that of true *Mus vociferans* that no detailed description is necessary. When series of specimens are compared, however, it is at once seen that those from Pulo Lankawi are distinctly more yellow than those from the type locality of the species. The difference is due in part to a slight reduction in the number of dark hairs on the back in the insular animal, but to a certain extent also to a change in the ochraceous ground color. The latter, particularly on the cheeks, flanks, and outer side of thighs, is visibly though faintly more yellow than in the Trong specimens. Underparts cream-buff. Tail whitish above and below distally, bicolor at base. The brown dorsal area scarcely reaches middle of tail, while in true *Mus vociferans* it extends beyond middle and often nearly to tip.

*Skull and teeth*.—In size and general form the skull agrees with that of *Mus vociferans vociferans*, but when viewed from the side a slight though very constant difference in the form of the braincase becomes apparent. In both animals the middle portion of the parietals is convex, rising as a distinct though low prominence above the level of the interparietal and that of the frontals. This convexity is so exaggerated in *Mus vociferans lancavensis* that skulls are easily recognized either by sight or touch.

Teeth similar to those of true *Mus vociferans*.

*Measurements*.—External measurements of type: total length, 520; head and body, 209\*; tail vertebræ, 311\*; hind foot, 45; hind foot without claws, 42. Average of five specimens, including the type: total length, 543 (520-559); head and body, 222 (209-229); tail vertebræ, 321 (311-330); hind foot, 46 (45-47); hind foot without claws, 43 (42-44).

*Specimens examined*.—Five skins and nine skulls, all from the type locality.

*Remarks*.—While this insular race is distinguished from true *Mus vociferans* by no one constant character the sum of its peculiarities are enough to make it readily distinguishable. The slight difference in size is chiefly due to the shorter tail of the insular form.†

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\*Collector's measurement.

†In seven topotypes of *Mus vociferans* the tail averages 342 mm., with extremes of 323 mm. and 380 mm.

*Mus surifer flavidulus* subsp. nov.

*Type*.—Adult female (skin and skull), No. 104,330 United States National Museum. Collected on Pulo Lankawi, December 4, 1899. Original number 109.

*Characters*.—Smaller than *Mus surifer surifer* from Trong, Lower Siam; tail usually a little shorter than head and body; ground color of sides and upper parts yellower (less tawney) than in the mainland form, and dark shading less conspicuous; belly cream-buff instead of white; skull smaller than that of the typical race, the braincase smaller and less ridged.

*Color*.—The color is as in true *Mus surifer* except that throughout the pelage there is a stronger tendency to yellowish tints. Ground color of sides and back light orange-buff, rarely as deep as in the Trong animal, which often approaches tawny-ochraceous. Underparts pale cream-buff or yellowish white. The dark brown hairs of the upperparts are distributed as in *Mus surifer surifer*; but they appear to be fewer in number. Feet and tail as in the mainland animal, the latter sharply bicolor nearly to tip, its distal extremity whitish above and below.

*Skull and teeth*.—Skull distinctly smaller than that of *Mus surifer*, and in general of much the same form. The braincase is, however, broader in proportion to the length of the skull, and the supraorbital ridges are less conspicuously developed. The interparietal is similar to that of the mainland animal and does not approach the peculiar triangular form found in the representative of the species occurring on the Butang Islands.

*Teeth* as in typical *Mus surifer*.

*Measurements*.—External measurements of type: total length, 355; head and body, 197; tail vertebrae, 158; hind foot, 37.6; hind foot without claws, 36. Average of ten specimens including the type: total length, 335 (305-369); head and body, 175 (159-197); tail vertebrae, 160 (146-172); hind foot, 39 (37-42); hind foot without claws, 37 (36-40).

Cranial measurements of type: greatest length, 44; basal length, 37; basilar length, 34.8; palatal length, 18; least width of palate between anterior molars, 5; diastema, 12.6; length of incisive foramen, 6.4; combined breadth of incisive foramina, 3.6; length of nasals, 17; combined breadth of nasals, 5; zygomatic breadth, 20; interorbital breadth, 7; mastoid breadth, 15; breadth of braincase above roots of zygomata, 17; depth of braincase at front of basioccipital, 11; frontopalatal depth at posterior extremity of nasals, 10; least depth of rostrum immediately behind incisors, 7.8; maxillary toothrow (alveoli), 6.8; width of front upper molar, 2.2; mandible, 23.6; mandibular molar series (alveoli), 6.6.

*Specimens examined*.—Thirteen skins, twenty skulls, and one specimen in alcohol, all from Pulo Lankawi.

*Remarks*.—By its small size and yellowish color this race is readily distinguishable from that of the mainland as well as from that of the nearby Butang Islands.

***Mus surifer butangensis* subsp. nov.**

*Type*.—Adult male (skin and skull) No. 104,309 United States National Museum. Collected on Pulo Adang, Butang Islands, December 16, 1899. Original number 157.

*Characters*.—More robust than *Mus surifer surifer* from Trong, Lower Siam; tail distinctly shorter than head and body; ground color of sides and upper parts darker and less bright than in the mainland form, and dark shading more diffuse; belly dirty buff; skull with the rostrum deeper, the braincase relatively narrower and more ridged, and the interparietal more distinctly triangular in outline.

*Color*.—The color differs from that of the typical race in the dullness of the fulvous tints. These are very nearly ochraceous-buff in marked contrast with the orange-buff of *Mus surifer surifer* and *M. surifer flavidulus*. The sprinkling of blackish hairs is very diffuse, adding to the peculiar aspect of the animal. Underparts soiled cream-buff. Tail and feet as in the related forms.

*Skull and teeth*.—The skull, while not actually larger than in the mainland race is more angular and heavily ridged. The rostrum when viewed from the side is distinctly deeper and the braincase appears to be slightly narrower, though the latter character is not very well marked. The outline of the interparietal is nearly a perfect isosceles triangle the base of which (the anterior edge) is about one and one half times as long as either side. Teeth as in typical *Mus surifer*.

*Measurements*.—External measurements of type: total length, 374; head and body, 203; tail vertebrae, 171; hind foot, 43; hind foot without claws, 41. Average of twelve specimens from the type locality: total length, 353 (311-381); head and body, 194 (178-210); tail vertebrae, 159 (133-171); hind foot, 41 (38.5-43); hind foot without claws, 38 (37-41). Average of three specimens from Pulo Rawi: total length, 353 (330-356); head and body, 192 (184-203); tail vertebrae, 160 (152-165); hind foot, 39 (38.5-40); hind foot without claws, 36.8 (36.5-37).

*Specimens examined*.—Fifteen: twelve from Pulo Adang, and three from Pulo Rawi, Butang Islands.

*Remarks*.—The three skins from Pulo Rawi agree very closely with those from the type locality though in color they are slightly less dull.

***Mus pannosus* sp. nov.**

*Type*.—Adult male No. 104,110 United States National Museum. Collected on Pulo Adang, Butang Islands, December 14, 1899. Original number 146.

*Characters*.—Similar to *Mus tambulinicus* Miller, but with larger ears, pelage of upper parts less suffused with red, and entire underparts grizzled with gray. Audital bullae larger than in *Mus tambulinicus*.

*Color*.—Back a rather coarse grizzle of light wood-brown and blackish brown the two colors mixed in nearly equal proportions. Sides very



dull buff-yellow heavily sprinkled with dark brown. Ventral surface dull, pale, buff, strongly suffused with drab-gray, particularly along median line. Chin and throat usually dull buffy white scarcely tinged with gray.

*Skull.* — The skull is similar to that of *Mus tambelanicus* except that the audital bullae are very noticeably larger and less depressed on the outer side. Teeth as in *Mus tambelanicus*, that is, like those of *Mus alexandrinus*, only larger.

*Measurements.* — External measurements of type: total length, 406; head and body, 203; tail vertebrae, 203; hind foot, 41; hind foot without claws, 38. Average of seven specimens from the type locality: total length, 386 (373-406); head and body, 196 (184-203); tail vertebrae, 190 (184-203); hind foot, 40 (38-41.5); hind foot without claws, 38 (35-39). An adult male from Pulo Rawi measures: total length, 409; head and body, 203; tail vertebrae, 196; hind foot, 39; hind foot without claws, 36.

*Specimens examined.* — Ten (three in alcohol) from Pulo Adang, and three from Pulo Rawi, Butang Islands.

*Remarks.* — The close resemblance of this species to *Mus tambelanicus*, and its unlikeness to the small *Mus alexandrinus* of the adjacent mainland suggest that the two large animals are less closely related to the latter than I at first supposed *Mus tambelanicus* to be. While of the same general form as the roof rat they are heavier animals with coarser more shaggy fur.

#### *Mus cremoriventer* subsp. ?

Two specimens (one in alcohol) from Pulo Lankawi and a third from Pulo Adang differ from true *Mus cremoriventer* in a strong yellowish suffusion of the entire pelage. As they were taken at practically the same season as the original specimens of *M. cremoriventer* there is little probability that the differences are due to individual variation. Without further material, and particularly in the absence of series of the yellowish *Mus flaviventer* from the Anambas, it seems unwise to attempt to define the present race.

#### *Ratufa melanopepla* Miller.

One specimen, Pulo Lankawi, December 9, 1899.

#### *Sciurus concolor* Blyth.

Two specimens from Pulo Lankawi and three from Pulo Adang. They agree in all essential characters with skins from Trong, Lower Siam, but whether the same as the true *concolor* of Malacca it is at present impossible to determine.

#### *Tragulus umbrinus* sp. nov.

*Type.* — Adult male (skin and skull) No. 104,414, United States National Museum. Collected on Pulo Lankawi, December 7, 1899. Original number, 131.

*Characters*.—Similar to *Tragulus canescens*\* of the adjacent mainland, but smaller in size and much darker in color. Throat stripes blackish brown with scarcely a trace of pale speckling. Belly heavily washed with fulvous gray.

*Color*.—Ground color of back a deeper, brighter orange-buff than in *T. canescens* and blackish clouding much in excess of buff. Sides and flanks as in the mainland animal but conspicuously darker, owing to the greater admixture of brown. Entire neck from crown to shoulders, and laterally to outer white throat stripes, blackish seal-brown, many of the hairs with a subterminal orange-buff area about 3 mm. in length. The buff rings give the dark area a speckled appearance, but they are not sufficiently numerous to produce grizzling, except occasionally at the sides of the neck. Upper surface of head and face slightly darker than back; cheeks and ill defined streak over and in front of eye paler. *Lateral dark throat stripes clear blackish seal-brown scarcely speckled with buff*. Collar like sides of body, only more finely grizzled. Chest and posterior half of belly white, the intermediate region heavily clouded with yellowish gray, darker and clearer along median line. Outer surface of legs dull ochraceous somewhat clouded with dark brown.

*Skull and teeth*.—Skull as in *Tragulus canescens*, but slightly smaller. Relative size of teeth as in the mainland animal, therefore considerably greater than in *T. napu*.

*Measurements*. External measurements of type: total length, 596; head and body, 520; tail vertebrae, 76; hind foot, 135; hind foot without hoof, 123; ear from meatus, 34; width of ear, 22. External measurements of a second adult male from the type locality: total length, 584; head and body, 508; tail vertebrae, 76; hind foot, 128; hind foot without hoof, 115.

Cranial measurements of type: greatest length, 112; basal length, 108; basilar length, 100; zygomatic breadth, 48; mandible, 90; maxillary toothrow (alveoli), 30; mandibular toothrow (alveoli), 47.

*Weight*.—Weight of type 3.63 kg. Weight of second adult, 3.4 kg.

*Specimens examined*.—Three, all from the type locality.

### *Tragulus javanicus* (Gmelin).

Thirteen specimens from Pulo Lankawi and two from Pulo Adang are indistinguishable from those taken on the mainland.

### *Lutra barang* F. Cuvier.

One adult female, Pulo Lankawi, December 10, 1899. Measurements: total length, 1090; head and body, 673; tail vertebrae, 419; hind foot, 128.

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\*See *antea*, p. 185.

***Tupaia ferruginea* Raffles.**

Two specimens from Pulo Lankawi and one each from Pulo Adang and Pulo Rawi are indistinguishable from those taken in Trong, Lower Siam.

***Galeopithecus volans* (Linnaeus).**

Two specimens, both from Pulo Adang.

***Emballonura peninsularis* Miller.**

Nine specimens (one skin), Pulo Rawi, Butang Islands, December 19, 1899.

***Semnopithecus obscurus* Blyth.**

Two were taken on Pulo Lankawi, December 5, 1899.

***Mus surifer butangensis* subsp. nov.**

*Type*.—Adult male (skin and skull) No. 104,309 United States National Museum. Collected on Pulo Adang, Butang Islands, December 16, 1899. Original number 157.

*Characters*.—More robust than *Mus surifer surifer* from Trong, Lower Siam; tail distinctly shorter than head and body; ground color of sides and upper parts darker and less bright than in the mainland form, and dark shading more diffuse; belly dirty buff; skull with the rostrum deeper, the braincase relatively narrower and more ridged, and the interparietal more distinctly triangular in outline.

*Color*.—The color differs from that of the typical race in the dullness of the fulvous tints. These are very nearly ochraceous-buff in marked contrast with the orange-buff of *Mus surifer surifer* and *M. surifer flavidulus*. The sprinkling of blackish hairs is very diffuse, adding to the peculiar aspect of the animal. Underparts soiled cream-buff. Tail and feet as in the related forms.

*Skull and teeth*.—The skull, while not actually larger than in the mainland race is more angular and heavily ridged. The rostrum when viewed from the side is distinctly deeper and the braincase appears to be slightly narrower, though the latter character is not very well marked. The outline of the interparietal is nearly a perfect isosceles triangle the base of which (the anterior edge) is about one and one half times as long as either side. Teeth as in typical *Mus surifer*.

*Measurements*.—External measurements of type: total length, 374; head and body, 203; tail vertebrae, 171; hind foot, 43; hind foot without claws, 41. Average of twelve specimens from the type locality: total length, 353 (311-381); head and body, 194 (178-210); tail vertebrae, 159 (133-171); hind foot, 41 (38.5-43); hind foot without claws, 38 (37-41). Average of three specimens from Pulo Rawi: total length, 353 (336-356); head and body, 192 (184-203); tail vertebrae, 160 (152-165); hind foot, 39 (38.5-40); hind foot without claws, 36.8 (36.5-37).

*Specimens examined*.—Fifteen: twelve from Pulo Adang, and three from Pulo Rawi, Butang Islands.

*Remarks*.—The three skins from Pulo Rawi agree very closely with those from the type locality though in color they are slightly less dull.

***Mus pannosus* sp. nov.**

*Type*.—Adult male No. 104,110 United States National Museum. Collected on Pulo Adang, Butang Islands, December 14, 1899. Original number 146.

*Characters*.—Similar to *Mus tambelanicus* Miller, but with larger ears, pelage of upper parts less suffused with red, and entire underparts grizzled with gray. Audital bullae larger than in *Mus tambelanicus*.

*Color*.—Back a rather coarse grizzle of light wood-brown and blackish brown the two colors mixed in nearly equal proportions. Sides very

dull buff-yellow heavily sprinkled with dark brown. Ventral surface dull, pale, buff, strongly suffused with drab-gray, particularly along median line. Chin and throat usually dull buffy white scarcely tinged with gray.

*Skull*.—The skull is similar to that of *Mus tambelanicus* except that the auditory bullæ are very noticeably larger and less depressed on the outer side. Teeth as in *Mus tambelanicus*, that is, like those of *Mus alexandrinus*, only larger.

*Measurements*.—External measurements of type: total length, 406; head and body, 203; tail vertebrae, 203; hind foot, 41; hind foot without claws, 38. Average of seven specimens from the type locality: total length, 386 (373-406); head and body, 196 (184-203); tail vertebrae, 190 (184-203); hind foot, 40 (38-41.5); hind foot without claws, 38 (35-39). An adult male from Pulo Rawi measures: total length, 409; head and body, 203; tail vertebrae, 196; hind foot, 39; hind foot without claws, 36.

*Specimens examined*.—Ten (three in alcohol) from Pulo Adang, and three from Pulo Rawi, Butang Islands.

*Remarks*.—The close resemblance of this species to *Mus tambelanicus*, and its unlikeness to the small *Mus alexandrinus* of the adjacent mainland suggest that the two large animals are less closely related to the latter than I at first supposed *Mus tambelanicus* to be. While of the same general form as the roof rat they are heavier animals with coarser more shaggy fur.

#### *Mus cremoriventer* subsp. ?

Two specimens (one in alcohol) from Pulo Lankawi and a third from Pulo Adang differ from true *Mus cremoriventer* in a strong yellowish suffusion of the entire pelage. As they were taken at practically the same season as the original specimens of *M. cremoriventer* there is little probability that the differences are due to individual variation. Without further material, and particularly in the absence of series of the yellowish *Mus fluriventer* from the Anambas, it seems unwise to attempt to define the present race.

#### *Ratufa melanopepla* Miller.

One specimen, Pulo Lankawi, December 9, 1899.

#### *Sciurus concolor* Blyth.

Two specimens from Pulo Lankawi and three from Pulo Adang. They agree in all essential characters with skins from Trong, Lower Siam, but whether the same as the true *concolor* of Malacca it is at present impossible to determine.

#### *Tragulus umbrinus* sp. nov.

*Type*.—Adult male (skin and skull) No. 104,414, United States National Museum. Collected on Pulo Lankawi, December 7, 1899. Original number, 134.

*Characters*.—Similar to *Tragulus canescens*\* of the adjacent mainland, but smaller in size and much darker in color. Throat stripes blackish brown with scarcely a trace of pale speckling. Belly heavily washed with fulvous gray.

*Color*.—Ground color of back a deeper, brighter orange-buff than in *T. canescens* and blackish clouding much in excess of buff. Sides and flanks as in the mainland animal but conspicuously darker, owing to the greater admixture of brown. Entire neck from crown to shoulders, and laterally to outer white throat stripes, blackish seal-brown, many of the hairs with a subterminal orange-buff area about 3 mm. in length. The buff rings give the dark area a speckled appearance, but they are not sufficiently numerous to produce grizzling, except occasionally at the sides of the neck. Upper surface of head and face slightly darker than back; cheeks and ill defined streak over and in front of eye paler. *Lateral dark throat stripes clear blackish seal-brown scarcely speckled with buff*. Collar like sides of body, only more finely grizzled. Chest and posterior half of belly white, the intermediate region heavily clouded with yellowish gray, darker and clearer along median line. Outer surface of legs dull ochraceous somewhat clouded with dark brown.

*Skull and teeth*.—Skull as in *Tragulus canescens*, but slightly smaller. Relative size of teeth as in the mainland animal, therefore considerably greater than in *T. napu*.

*Measurements*.—External measurements of type: total length, 596; head and body, 520; tail vertebrae, 76; hind foot, 135; hind foot without hoof, 123; ear from meatus, 34; width of ear, 22. External measurements of a second adult male from the type locality: total length, 584; head and body, 508; tail vertebrae, 76; hind foot, 128; hind foot without hoof, 115.

Cranial measurements of type: greatest length, 112; basal length, 108; basilar length, 100; zygomatic breadth, 48; mandible, 90; maxillary tooththrow (alveoli), 30; mandibular tooththrow (alveoli), 47.

*Weight*.—Weight of type 3.63 kg. Weight of second adult, 3.4 kg.

*Specimens examined*.—Three, all from the type locality.

#### *Tragulus javanicus* (Gmelin).

Thirteen specimens from Pulo Lankawi and two from Pulo Adang are indistinguishable from those taken on the mainland.

#### *Lutra barang* F. Cuvier.

One adult female, Pulo Lankawi, December 10, 1899. Measurements: total length, 1090; head and body, 673; tail vertebrae, 419; hind foot, 128.

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\*See *antea*, p. 185.

***Tupaia ferruginea* Raffles.**

Two specimens from Pulo Lankawi and one each from Pulo Adang and Pulo Rawi are indistinguishable from those taken in Trong, Lower Siam.

***Galeopithecus volans* (Linnaeus).**

Two specimens, both from Pulo Adang.

***Emballonura peninsularis* Miller.**

Nine specimens (one skin), Pulo Rawi, Butang Islands, December 19, 1899.

***Semnopithecus obscurus* Blyth.**

Two were taken on Pulo Lankawi, December 5, 1899.





PROCEEDINGS  
OF THE  
BIOLOGICAL SOCIETY OF WASHINGTON

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RIBES MESCALERIUM, AN UNDESCRIBED CURRANT  
FROM NEW MEXICO AND TEXAS.

BY FREDERICK V. COVILLE.

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Dr. Valery Havard, in his report on the Flora of Western and Southern Texas, identified one of his plants as *Ribes viscosissimum* Pursh, and wrote of it as "the only gooseberry seen in western Texas, growing sparingly in the Guadalupe Mountains."\* On the basis of the same observations Dr. John M. Coulter included *viscosissimum* in his Botany of Western Texas, commenting on it as occurring "sparingly in the mountains west of the Pecos, and apparently the only gooseberry of western Texas."† Dr. Havard's specimen, which is in the National Herbarium, was collected in the Guadalupe Mountains, El Paso County, Texas, in October, 1881. It has neither flowers nor fruit, and has long been a puzzle on account of its peculiar vegetative characters, intermediate between those of *viscosissimum* and *cereum*. In Professor Coulter's description the flower and fruit characters were of course drawn from Rocky Mountain specimens of typical *viscosissimum*, so that the Texas plant has really never been described, nor does any good material of it seem to have been collected.

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\*Havard, Proc. U. S. Nat. Mus. 8:524. 1885.

†Contr. U. S. Nat. Herb. 2:109. 1891.

In 1897 Professor E. O. Wooten collected in the White Mountains of Lincoln County, New Mexico, a currant which he distributed with a mark of doubt as *Ribes cereum* Dougl., No. 281 of his collection of that year. The specimen was remarkable in being black-fruited, the fruit of *cereum* being invariably of a light red color. Concluding that this represented an undescribed species I wrote, early last spring, to Professor Wooten, who courteously loaned me his collection of New Mexican *Ribes*. Among these was another fruiting specimen of the new currant, from the Sacramento Mountains, and a fragmentary flowering specimen from the White Mountains.

As Mr. Vernon Bailey, of the Biological Survey, expected to visit southeastern New Mexico during the summer I requested him to look out for this currant, and he has lately handed me some fine flowering specimens of it from the Sacramento Mountains. From all this material the following description has been drawn.

*Ribes mescalerium* sp. nov.

Erect shrub, without spines or prickles; one-year-old twigs cream to buff-colored, glandular-hairy, the epidermis on older branches soon splitting and weathering away, leaving the branches chestnut brown often overlaid with some thin grayish tissue; leaf-blades roughly orbicular in outline, usually broader than long, 1.5 to 2.5 or sometimes even 3.5 cm. wide, truncate, broadly wedge-shaped, or somewhat cordate at base, 3 to 5-lobed, the lobes unevenly crenate-dentate, or even indistinctly lobulate, with gland-tipped hairs on both surfaces, and on the lower surface some glandless pubescence also; petioles usually a little shorter than the blades, closely pubescent and with a few larger gland-tipped hairs; racemes short, almost capitate, closely 2 to 4 or sometimes even 6-flowered, the glandular-hairy and pubescent deflexed peduncle commonly 8 to 15 mm. in length; bracts obovate, sessile, toothed toward the apex, glandular-hairy, 3 to 5 or sometimes even 7 mm. long; flowers sessile or nearly so, the usually very short pedicels glandular-hairy and pubescent; ovary glandular-hairy; tube of calyx (moist) about 5 to 6 mm. long and 3.5 broad, sparingly glandular-hairy, greenish white, the reflexed ovate-oblong lobes broadly acute or obtuse, 2 to 3 mm. long, pubescent on the outside toward the apex; petals white, rotund, about 2 mm. long; stamens with filaments adhering to the calyx tube as far as the throat, the free portion shorter than the anther, this when expanded about 1 mm. in breadth and length; style stout, smooth, shortly two-lobed at the slightly exserted apex; fruit spherical, black, without bloom, sparingly glandular-hairy, 5 to 8 mm. in diameter in dried specimens, the flattened ones sometimes even 10 mm.

Type specimen in the United States National Herbarium, collected July 21, 1899, in the Sacramento Mountains, at Fresnal, Otero County, New Mexico, at an altitude of 7,200 feet, by E. O. Wooten.

So far as known *Ribes mescalegium* is confined to the White and Sacramento Mountains of Lincoln and Otero counties, New Mexico, and the neighboring Guadalupe Mountains which extend across the State line into El Paso County, Texas. The specimens have been collected at altitudes varying from 7,000 to 9,000 feet. Mr. Bailey considers it a plant of the Canadian zone. The flowering specimens are dated May 11 and June 1, and the fruiting specimens July 21 and August 5. Dr. Havard's designation of this currant as a gooseberry was probably based chiefly on the paucity of the fruits in the raceme, a character possessed also by *Ribes cereum*. Although these and other species of the *cereum-viscosissimum-sanguineum* group, in some of which the racemes are many-flowered, have a well-defined calyx tube like the gooseberries, none of them bear spines or prickles on the branches and they are thus easily separable from the true gooseberries.

From *Ribes cereum* our plant is distinguishable in the herbarium by the stalked character of the glands on the leaves and young twigs, by the relatively broader calyx tube, its ratio of breadth to length being about 1 to  $1\frac{1}{4}$  or  $1\frac{1}{2}$ , and by its black fruit. *Ribes cereum* has the glands on its leaves and young twigs almost always sessile, a corolla tube with the ratio of breadth to length about 1 to  $2\frac{1}{2}$  or  $3\frac{1}{2}$ , and a fruit of bright red color. With *viscosissimum* the new species agrees in the stalked character of the glands on the vegetative parts of the plant, and in the black color of the fruit, but the leaves, flowers, and fruit of *viscosissimum* are much larger, the flowers being about 15 mm. long when the calyx lobes are not reflexed, and the tube about 6 mm. broad, while the pedicels are several millimeters, often 1 cm. or more, in length, and the elliptical-oblong fruit is commonly 8 to 10 mm. broad by 10 to 12 mm. long. The oblong anthers of *viscosissimum*, commonly 1.5 mm. in length, in all the specimens examined, are exceeded by the free portion of the filament. Mr. Bailey states that the bushes are taller than those of *cereum*, being commonly 4 to 6 feet high, and do not spread out into the broadly rounded and closely

branched form common in *cereum*. *Viscosissimum* is ordinarily a few-branched straggling shrub 2 to 4 feet high.

The name selected for the species, *mescalereum*, commemorates the Mescalero Apaches, a tribe of Indians who in former times inhabited the region in which the plant occurs and who now occupy a reservation in the White Mountains of Lincoln County, New Mexico.

PROCEEDINGS  
OF THE  
BIOLOGICAL SOCIETY OF WASHINGTON

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POLYPODIUM HESPERIUM, A NEW FERN FROM  
WESTERN NORTH AMERICA.\*

BY WILLIAM R. MAXON.

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The prospect before one attempting to bring anything like order out of the substantial aggregate known as *Polypodium vulgare* is far from encouraging. Much uncertainty exists even as to the typical form of the species, and it is certainly to be doubted whether the common form of the eastern United States truly represents the species long ago characterized upon European material as *vulgare*. At one time Hooker regarded our eastern representative of varietal rank and briefly characterized it as var. *Americanum*;† but he seems to have disregarded it in his later work. Much confusion has arisen also as to the identity of his var. *occidentale*‡ founded upon specimens collected at the mouth of the Columbia and at Sitka. So far as the description goes it applies well to the plant later described by Kellogg as *P. falcatum*† and again by Eaton as *P. glycyrrhiza*,§ but it may with equal propriety be referred to another form of the Pacific coast especially abundant in Alaska and the Aleutian Islands which is rather coriaceous in texture and in

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†Flora Bor. Am. 2 : 258. 1840.

‡Proc. Cad. Acad. Sci. I, 1 : 20. 1854.

§Am. Journ. Sci. II, 22 : 138. 1856.

some cases serrated as the variety was originally described. Be that as it may, the species here described as new is clearly not closely related to either of Hooker's "varieties." It comprises the common form of the whole mountain-region of the western United States, and is essentially different from the material of eastern North America. I propose the name:

***Polypodium hesperium.***

Rhizome rather stout, firm, creeping, chaffy with dark brown scales: fronds 4 to 13 inches long, clustered: stipe 1 to 5 inches long, smooth, decidedly stramineous: lamina 3 to 8 inches long, 1 to 1½ inches broad, linear-oblong, apical portion usually entire and acuminate, texture thinner than in *rulgare*, the under surface sparsely glandular: pinnae mostly alternate, 6" to 10" long, 3" to 5" broad, elliptical or somewhat spatulate, always narrowest at base, broadly rounded at tip: margins obscurely (or, less often, decidedly) crenate: veins forking two or usually three times, veinlets free: sori very large, oval, borne midway between the midvein and margin, at the end of the lowermost veinlet: spores greenish-yellow, smoothish.

Type specimen, No. 303,284 in the U. S. National Herbarium, Smithsonian Institution, collected by M. W. Gorman, No. 642, August 21, 1897, in Coyote Cañon, Lake Chelan, Washington. The geographical distribution of the species embraces the territory from the Rincon and San Francisco Mountains in Arizona to Washington and British Columbia, Idaho and Montana. Within this region *rulgare* does not occur.

It is doubtful whether *hesperium* is very closely related to the eastern *rulgare*. Its affinities seem rather to lie with the *Polypodiums* of the Pacific coast, one especially notable feature which it possesses in common with them being the hard licorice-like rootstock. The rhizomes of the eastern *rulgare*, on the other hand, are not only spongy and quite acrid but more or less unsavory in taste. The chaff of *hesperium* too is very much darker than that of the material of the eastern United States and the stipes are much more thickly clustered. The most prominent feature is the very characteristic shape of the pinnae, often half as broad as long.

The name is chosen in allusion to the occurrence of the species in western North America. It is barely possible, but hardly probable, that the species here described is identical with the var. *rotundatum* of Milde, which is however antedated by the *Polypodium rotundatum* of Sieber, applied to a West Indian species.

Nearly fifty specimens of this species have been examined, from the herbaria of the National Museum, Yale University, the California Academy of Sciences, Professor L. M. Underwood, Mr. B. D. Gilbert, and Mr. J. B. Flett. I desire to express my thanks to the curators of the public herbaria and to the gentlemen above mentioned, especially to Mr. Flett who has furnished an excellent suite of specimens from Washington, ranging from altitudes of 3600 to 5500 feet.

U. S. National Museum, Washington, D. C.

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PROCEEDINGS

OF THE

Biological Society of Washington

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VOLUME XIV

1901

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WASHINGTON  
PRINTED FOR THE SOCIETY  
1902

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\*Vice C. L. Pollard who served in this position from January, 1901 to October, 1901.



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OFFICERS AND COUNCIL  
OF THE  
BIOLOGICAL SOCIETY OF WASHINGTON

For 1901.

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(ELECTED DECEMBER 29, 1900.)

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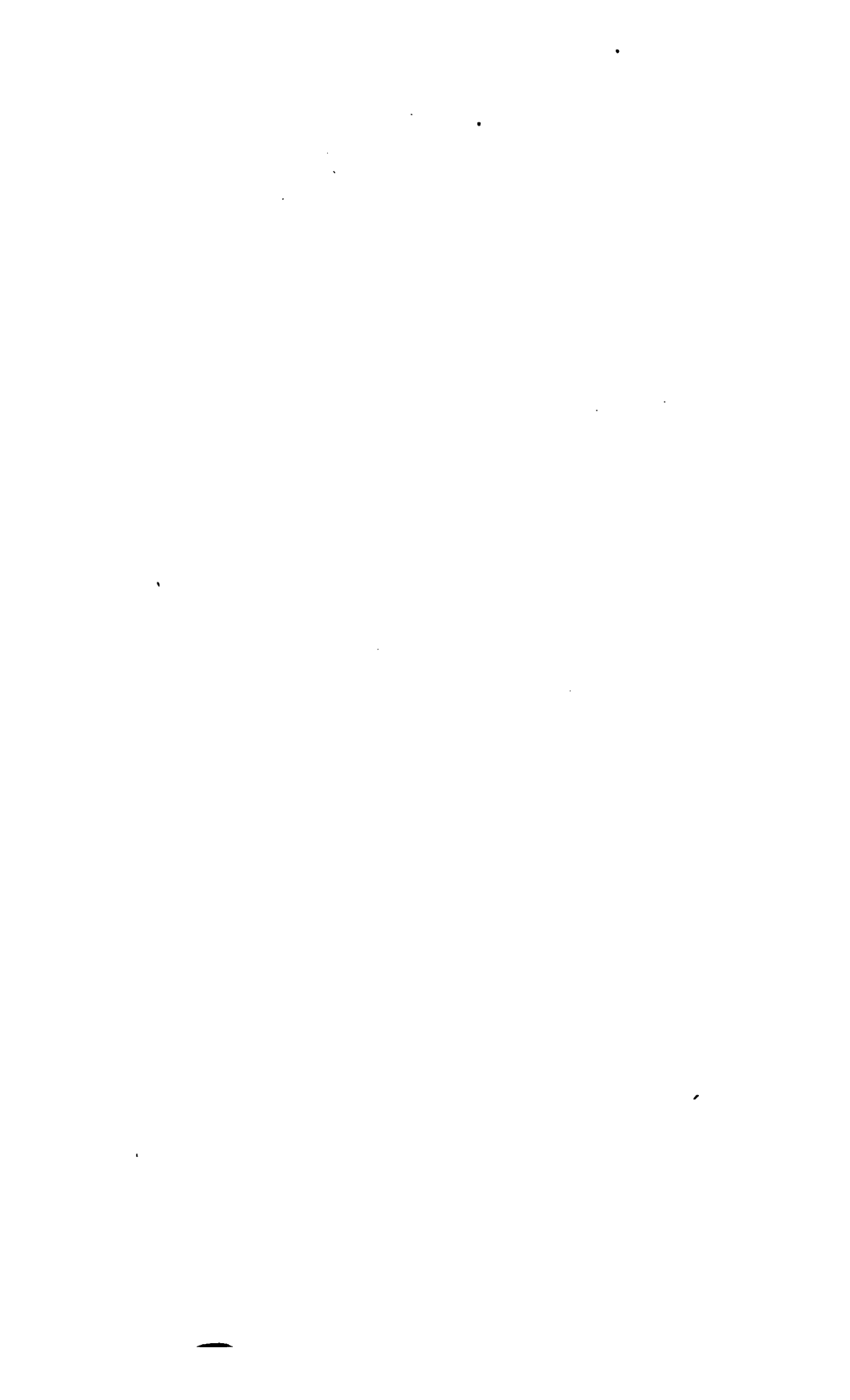
T. S. PALMER

DAVID WHITE

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\*Ex-Presidents of the Society.

†Resigned Oct., 1901, succeeded by W. P. HAY.



PROCEEDINGS  
OF THE  
BIOLOGICAL SOCIETY OF WASHINGTON

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PROCEEDINGS.

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The Society meets in the Assembly Hall of the Cosmos Club on alternate Saturdays at 8 p. m. Brief notices of the meetings, with abstracts of the papers, are published in *Science*.

**January 12, 1901—332d Meeting.**

The President in the chair and 30 persons present.

W. H. Dall exhibited X ray photographs showing the inner structure of shells.

Vernon Bailey exhibited a plume hunters' skin of a grebe.

The following communications were presented:

Frank Cameron: The Formation of Black Alkali in Plants.\*

T. H. Kearney: The Effect of Alkali Salts on the Growth of Seedling Plants.\*

O. F. Cook: The Origin of the Cocoanut.†

**January 26, 1901—333d Meeting.**

The President in the chair and 48 persons present.

The program for the evening consisted of a discussion of the subject, 'Former Land Connections Between Asia and North America,' with the following speakers: F. A. Lucas, Theo. Gill, W. H. Dall, F. V. Coville, and L. Stejneger.

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\*U. S. Dept. Agric. Report No. 71—under the title, *Some Mutual Relations Between Alkali Soils and Vegetation*.

†Cont. U. S. Nat. Herb. VII, No. 2, pp. 257-293, 1901.



**March 23, 1901—337th Meeting.**

The President in the chair and 41 persons present.

The following communications were presented:

S. D. Judd: Bird Food Problems (illustrated by lantern slides).

F. A. Lucas: Some Restorations of Dinosaurs (illustrated by lantern slides).

**April 6, 1901—338th Meeting.**

The President in the chair and 40 persons present.

The following communication was presented:

Erwin F. Smith: The Bacterial Diseases of Plants\* (illustrated by lantern slides).

**April 20, 1901—339th Meeting.**

The President in the chair and 26 persons present.

The following communications were presented:

O. F. Cook: The Shading of Coffee.†

C. L. Pollard: Some Strange Methods of Plant Naming.‡

Theo. Gill: On the Mode of Progression and Habits of Some Dinosaurs.

**May 4, 1901—340th Meeting.**

Vice President Ashmead in the chair and 25 persons present.

The following communications were presented:

T. H. Kearney: Loeb's Investigations into the Action of Ions upon Animal Structures, as Supplemented by Studies with Seedling Plants.

O. F. Cook: A Kinetic Theory of Evolution.§

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\*Published in part in *Centralblatt. f. Bakteriologie*, 2te Abth. VII Bd., pp. 88, 128, 190, 1901.

†Bull. No. 25, Div. of Botany, U. S. Dept. Agric., 1901.

‡Science, N. S., XIV, 280-285, Aug. 23, 1901.

§Science, N. S., XIII, 969-978, June, 1901.

**October 19, 1901—341st Meeting.**

Vice President Ashmead in the chair and 21 persons present.

The following communications were presented:

C. W. Stiles: The Recent International Zoological Congress.

W. H. Ashmead: An Entomologist in the Sandwich Islands.

Theo. Gill: Some Difficulties of Nomenclature at the Zoological Congress.

**November 2, 1901—342d Meeting.**

The President in the chair and 39 persons present:

H. J. Webber exhibited a diseased pineapple and discussed the cause of the condition.

The following communications were presented:

Charles Louis Pollard: Notes on a Trip to Mount Mitchell.

H. J. Webber: A Cowpea Resistant to Root Knot Worm.\*

Frederick V. Coville: Exhibition of Specimens of Alaskan Willows.

M. A. Carleton: Characteristics and Distribution of Xerophytic Wheats.†

**November 16, 1901—343d Meeting.**

The President in the chair and 28 persons present.

C. P. Hartley exhibited some malformed ears of corn grown from seed taken from ears similarly abnormal.

H. E. Van Deman exhibited a specimen of the ripe fruit of guava grown in Florida.

L. O. Howard announced that he had just learned through a letter from C. L. Marlatt that the original habitat of the San Jose scale insect had been found to be in China.

The following communications were presented:

H. G. Dyar: Notes on Mosquito Larvae.

Vernon Bailey: The Little Deer of the Chisos Mountains, Texas, with exhibition of specimens.

Barton W. Evermann: Birds in the Dry Season.

C. B. Simpson: Some Observations on Jack Rabbits.

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\*To be published as a Bulletin of the Bureau of Plant Industry, U. S. Dept. Agric.

†Bull. No. 3, Bureau Pl. Ind., U. S. Dept. Agric., under the title, Macaroni Wheats.



**November 30, 1901—344th Meeting.**

The President in the chair and 72 persons present.

William Palmer exhibited some plaster moulds of reptiles and batrachians which had been used for the purpose of misrepresenting facts by a newspaper writer.

The following communications were presented:

E. W. Nelson: A Naturalist in Yucatan.

H. J. Webber: The Strand Flora of Florida.

**December 14, 1901—345th Meeting.**

The President in the chair and 27 persons present.

The following communications were presented:

W. H. Holmes: Finds of Fossil Remains and Indian Implements in a Spring at Afton, Indian Territory.

W. A. Orton: The Wilt Disease of the Cowpea and its Control.\*

Theo. Gill and C. H. Townsend: The Largest Deep Sea Fish.†

William Palmer: A Study of Two 'Ghosts'.

**December 28, 1901—346th Meeting.**

(TWENTY-SECOND ANNUAL MEETING.)

The President in the chair and 13 members present.

The annual reports of the Recording Secretary and Treasurer for the year 1901 were read and approved. The following officers were then elected for the ensuing year:

President F. A. Lucas.

Vice-presidents: B. W. Evermann, W. H. Ashmead, F. H. Knowlton, T. S. Palmer.

Recording Secretary: W. H. Osgood.

Corresponding Secretary: T. W. Stanton.

Treasurer: David White.

Members of the Council: A. F. Woods, C. L. Pollard, M. B. Waite, H. J. Webber, W. P. Hay.

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\*To be published as a bulletin Bureau Plant Industry, U. S. Dept., Agric.

†Science, N. S. XIV, 937, Dec. 13, 1901.

The president then announced the following committees:

Committee on Communications: W. H. Osgood, B. W. Evermann, A. F. Woods, V. K. Chesnut.

Committee on Publications: W. P. Hay, T. S. Palmer, David White.



VOL. XIV, PP. 1-6

MARCH 9, 1901

PROCEEDINGS  
OF THE  
BIOLOGICAL SOCIETY OF WASHINGTON

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RIBES COLORADENSE, AN UNDESCRIBED CURRANT  
FROM THE ROCKY MOUNTAINS OF  
COLORADO.

BY FREDERICK V. COVILLE.

---

Several months ago in examining a collection of *Ribes* made by Mr. C. L. Shear in Colorado in 1896 and 1897, I found a fruiting specimen of the Rocky Mountain plant that has hitherto been identified by botanists with the species of the eastern United States, *R. prostratum* L'Her. The specimen had, however, black instead of red fruit, and on a critical examination other differences were developed. A search in the herbarium brought to light a few other specimens of this plant, in flower as well as in fruit, which have furnished excellent material for description, but the surprising fact was developed that the fruiting specimens on the type sheet of *Ribes wolffi* Rothr., which is in the National Herbarium, were identical with our plant. It became necessary, therefore, to make a critical examination of Dr. Rothrock's species.

*Ribes wolffi*\* was described from specimens collected in Colorado, those in flower from Mosquito Pass, those in fruit from

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\*Rothrock, Am. Nat. 8:358. 1874.

Twin Lakes,† and these specimens are now known to represent two distinct species. Dr. Rothrock cited also, as synonymous, a third plant, Watson's *Ribes sanguineum variegatum*,‡ a citation which led Dr. Watson later to reject Dr. Rothrock's species.§ The name *Ribes wolffi* has consequently disappeared from most botanical works. In this confusion it becomes necessary to restrict the use of the name and I therefore designate as the type of *Ribes wolffi* the flowering specimen in the National Herbarium collected by John Wolf in June, 1873, at Mosquito Pass, a few miles east of Leadville, Colorado, at an elevation between 10,000 and 11,000 feet. I have found *Ribes wolffi* in herbaria under the names *prostratum*, *viscosissimum*, and *hudsonianum*, with none of which species is it very closely related. Its nearest relative is Watson's *Ribes sanguineum variegatum*, a plant centering about the northern Sierra Nevada of California and distinct from true *sanguineum*. There is a question as to the proper name of this plant, which at the present time can not be satisfactorily determined. It may, therefore, continue to be called *Ribes sanguineum variegatum* until its correct name as a species can be definitely ascertained. Both *variegatum* and *wolffi* are plants with unarmed stems, almost smooth, maple-like leaf-blades, racemose inflorescence, the bracts ovate or obovate and with thin hyaline margins, ovaries and fruit bearing glanduliferous hairs, flowers greenish or reddish, and calyx-tube not more than 3 mm. long and shorter than the lobes.

*Wolffi* differs from *variegatum*, however, in its usually greenish-white calyx about 5 mm. long, its tube about 1 mm. long and the lobes about 3 or 4 times the length of the tube; petals broadly rhombic-obovate, about a third the length of the calyx lobes; and anthers, when fully expanded, a little broader than long. I have seen no mature fruit of the species. *Ribes sanguineum variegatum* has a usually red calyx about 6 mm. long, the tube about 2 mm. long, and the lobes about 1½ to 2 times

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†The localities are attached to the proper specimens through a comparison of the data furnished by Rothrock's original description, by the label on the specimens, and by the references to Wolf's itinerary given in the Report of the Secretary of War for 1873, volume 2, part 2, pages 483 and 484.

‡Wats. Bot. King Surv. 100. 1871.

§Wats. Bibl. Ind. 337. 1878

the length of the tube; petals oblong-ovate, about two-thirds the length of the calyx lobes; and anthers when expanded usually much longer than broad.

The specimens of *Ribes wolffi* that I have examined, in the National and Columbia University herbaria, and that of Mr. Frank Tweedy, are as follows:

Colorado:

Mosquito Pass, near Leadville, alt. 10,000 to 11,000 feet,  
*John Wolf*, 1873.

Hinsdale County, *F. N. Pease*, 1878.

Ouray County, near Silverton, on the headwaters of the  
Rio Las Animas, alt. 9,600 feet, *Frank Tweedy*, 1895  
(No. 195).

Ouray County, Mt. Abram, alt. 10,500 feet, *C. L. Shear*,  
1897 (No. 3195).

West La Plata Mountains, Bear Creek Divide, alt. 11,500  
feet, *Baker, Earle, and Tracy*, 1898 (No. 220).

Utah:

Wasatch Mountains, alt. 9,000 feet, *Sereno Watson*, 1869  
(No. 377).

Wasatch Mountains, American Fork Canyon, alt. 9,500  
*Marcus E. Jones*, 1880.

Mountains east of Gunnison, alt. 9,500 feet, *Lester F.*  
*Ward*, 1875 (No. 274).

"Central Utah, &c.," *C. C. Parry*, 1875.

*Ribes wolffi* having thus been delimited, the plant confounded with it by Rothrock, and by most authors referred to *Ribes prostratum* L'Her., is here described.

***Ribes coloradense* sp. nov.**

Plant apparently procumbent; stems devoid of spines and prickles, at first minutely pubescent and bearing some sessile glands, the thin silvery epidermis persisting for a few years over the brown bark; petioles commonly 3 to 6 cm. long, usually smooth on the back, the upper sides pubescent and glandular like the young twigs, the margins of the sheathing portion provided with a few large, gland-tipped bristles; leaf-blades

commonly 4 to 7 mm. in width, cordate-reniform in general outline, 5-lobed, smooth on both surfaces, except sometimes for a very sparse pubescence on the veins beneath and on the margins, and with scattered minute sessile glands, the lobes ovate-triangular, bluntly acute or obtuse, doubly crenate-dentate; flowers from buds situated below those producing the leaves, but occasionally developing a single rudimentary leaf; racemes loosely 6 to 12-flowered, the pedicels commonly 4 to 8 mm. long and like the main axis glandular-hairy and minutely pubescent; bracts narrowly linear to lanceolate-subulate, thick and herbaceous, not exceeding half the length of the pedicel, the lowermost one occasionally developing into a miniature leaf-blade; ovary glandular-hairy; calyx lobes widely spreading, slightly united at the base, ovate-rotund, slightly narrowed below to a very broad base, sparingly hairy on the outside with both gland-bearing and glandless hairs, greenish or somewhat purplish, the diameter of the open flower about 6 to 8 mm.; petals smooth, purplish, about 1 mm. long by 1.5 to 2 mm. broad, slenderly fan-shaped with much incurved sides; filaments smooth, of nearly uniform width throughout, about 1.2 mm. long, the anthers orbicular, a little less than 1 mm. in diameter; styles smooth, separate to the base, about 1.2 mm. long; fruit spherical, black without bloom, sparingly glandular-hairy, in our dried and flattened but not crushed specimens 6 to 10 mm. in diameter.

Type specimen in the United States National Herbarium, collected July 27, 1896, in a moist shady place in Marshall Pass, Colorado, at an altitude of about 10,500 feet, by C. L. Shear (No. 1156).

With *Ribes wolffi* the present species has no immediate relationship. Its racemes are developed from usually leafless lateral buds on one-year-old wood and its calyx has widely spreading lobes and no evident tube. It has several other distinguishing characters, perhaps the most conspicuous of which are the subulate-lanceolate thick green bracts of the inflorescence, and the sparsity of the ovary hairs tipped with purple glands. *Wolffi* has its racemes borne on short leafy branches, the calyx tube well defined though short, and the lobes only moderately spreading, the ovate or obovate-lanceolate, obtuse or broadly acute bracts with thin semi-transparent margins, and the ovary densely covered with yellowish-green stalked glands. To *Ribes prostratum*, however, and to *Ribes lariflorum* Pursh our new species is closely related. From the former it may be distinguished by the rarity of leaves from the flower buds, the blunter-character of its leaf lobes, a difference difficult to describe but better understood by a comparison of figures or specimens; its larger flowers, with calyx lobes sparingly hairy and about 3 mm. long; petals slenderly fan-shaped and much broader than long; and

black instead of red fruit. *Prostratum* has leaf-bearing flower buds, leaves with sharply acute to acuminate, serrate-dentate lobes, flowers with calyx lobes smooth, about 2 mm. in length, and obovate-oblong in outline, petals with rhombic blade on a rather broad stalk, the whole much longer than broad, and fruit red. From *laxiflorum* our new species may be distinguished by the lack of bloom on the fruit, by its usually blunter leaf-lobes and teeth, the scattered glanduliferous hairs on the calyx lobes, and the petals nearly twice as broad as high. *Laxiflorum* has its fruit black with a bloom, leaf lobes usually acute, no glandular hairs on the calyx lobes, and petals commonly a little longer and a little narrower than those of *coloradense*, therefore only slightly broader than long.

The specimens of *coloradense* consulted are as follows:

Colorado:

“Rocky Mountains,” *George Vasey*, 1868.

Mosquito pass, near Leadville, alt. 10,000 to 11,000 feet,  
*John Wolf*, 1873.

Marshall Pass, alt. about 10,000 feet, *C. L. Shear*, 1896  
(No. 1156).

“Southwestern Colorado,” [La Plata Mountains ?] Slide  
Rock Canyon, alt. 10,500 feet, *Baker, Earle*, and  
*Tracy*, 1898 (No. 289).

San Miguel County, near Telluride, on the headwaters of  
San Miguel River, alt. 10,000 feet, *Frank Treedy*,  
1894 (No. 190).

These three species, *prostratum*, *laxiflorum*, and *coloradense*, are very closely related and form a group which might be called, after the practice of the zoologists, a superspecies, or after the practice of some European botanists, a *species collectiva*. They differ in minor but well-defined characters, apparently do not intergrade, and each has a characteristic range distinct from that of the other two. *Prostratum* centers in eastern Canada, extending across the Great Lake and St. Lawrence region into the United States, continuing southward in the Appalachian district to North Carolina and westward in British America to Manitoba, Saskatchewan, Athabasca, and Mackenzie, and speci-

mens have been collected at Quesnelle in British Columbia. *Laxiflorum* is a characteristic species of the coast region of Alaska, reaching northward into the Yukon Valley and southward along the coast to Washington and Oregon, extending inland to the Selkirk Mountains of British Columbia and the Cascade Mountains of Washington. Westward *laxiflorum* occurs on the Alaska peninsula, in some of the Aleutian Islands, and in eastern Asia. *Coloradense* is known only from high elevations in the Rocky Mountains of Colorado, and is thus separated by several hundred miles from the known range of either of the others. *Laxiflorum* and *prostratum* apparently meet in British Columbia. All three species appear to belong to the Canadian zone, with a tendency to overrun into the Hudsonian.



PROCEEDINGS  
OF THE  
BIOLOGICAL SOCIETY OF WASHINGTON

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FIFTH LIST OF ADDITIONS TO THE FLORA OF  
WASHINGTON, D. C.

BY THEO. HOLM.

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Five years have elapsed since the publication of my fourth list of additions to the local flora,\* and it will be seen from the present paper that these five years of research have materially added to the number of species hitherto known to occur in the vicinity of Washington, in addition to which I have been able to record an extended range of many of the rarer species, formerly known from only a very few localities.

Through Dr. E. L. Greene's painstaking studies of various genera, more particularly of *Antennaria*, *Viola*, *Gerardia*, etc., these genera now appear to contain a number of excellent species, which formerly had been entirely overlooked or more or less confused; some of these species have even proved to be very common within the District of Columbia. In order to facilitate the use of this additional list, I have, with only a very few exceptions, followed the nomenclature and arrangement of the orders as in the previously published additions, these having been arranged in conformity with the fundamental work on the Flora, Lester F. Ward's "Guide to the Flora of Washington and Vicinity."†

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\*Proc. Biol. Soc. Wash. X, pp. 29-43, 1896.

†Bull. 22, U. S. Nat. Mus. 1881.

The discovery of species new to a local flora is always a great encouragement to the explorer, but it is nevertheless just as important to discover a well known but rare species in new localities; the rediscovery of an apparently lost or extinct species seems to us to be still more interesting and important, and we may cite among such instances the finding of *Aralia quinquefolia*, *Cicuta bulbifera*, *Phyllanthus* and *Cystopteris bulbifera*.

It is surprising to see how many rare species may be found in old, well known localities, when these are visited regularly every month. Frequent excursions to Great Falls, Marshall Hall, Surattsville, etc., have brought forth a number of rare plants, hitherto overlooked, and even the old and well explored region around the Reform School seems to furnish an almost incessant increase of new or rare plants. On the other hand some of the older and most interesting localities are rapidly undergoing destruction, as for instance the famous Terra Cotta swamp, which at present is almost entirely changed to a miserable "corn field," and many of the species which were reported from that region are no longer to be found there. So much the more does it seem necessary to keep permanent track of the representatives of our local flora before the immediate vicinity becomes altogether transformed to building-lots and gardens.

In the present list some very interesting contributions have been kindly furnished by Dr. E. L. Greene, Messrs. Thos. H. Kearney, Jr., Wm. R. Maxon, G. W. Oliver, and Wm. Palmer, whose names appear in connection with their respective discoveries; where no collector is named, the species has been found by the writer himself, and the plants are all deposited in his private herbarium. The species marked with an asterisk are new to the local flora.

1. *Clematis Virginiana* L.

Four Mile Run; marshes near Kenilworth.

12. *Ranunculus ambigens* Wats.

Muddy creek-bottom near Marshall Hall. E. L. Greene.

13. *Ranunculus pusillus* Poir.

In a pool among the rocks near Sandy Landing.

15. *Ranunculus abortivus* L., var. *micranthus* Nutt.

Not uncommon in the woods between Sandy Landing and Great Falls,

30b. *Ranunculus septentrionalis* Poir.

High Island. E. L. Greene; swamps near Marshall Hall.

33. *Caulophyllum thalictroides* Michx.

Ravine near mouth of Scott's Run, Va.

34. *Jeffersonia diphylla* Pers.

Ravine near mouth of Scott's Run, Va.

40. *Papaver dubium* L.

Meadow near mouth of Scott's Run, Va.

47. *Nasturtium sylvestre* R. Br.

Wet places among rocks at Great Falls; on the river-shore at the mouth of Scott's Run, Va.; High Island; ditches near Alexandria.

49a. *Nasturtium palustre* D. C. var *hispidum* Fisch. & Mey.

Ditch near Marshall Hall.

61. *Cardamine hirsuta* L. (*C. intermedia* Horn.)

Swamps near Terra Cotta.

62a. *Cardamine parviflora* L.

Abundant in the woods near Soldiers' Home; Sandy Landing; Great Falls and several other places; evidently not uncommon in the District.

62b. *Cardamine silvatica* Link.

Ditch near Soldiers' Home.

62c. *Cardamine Pennsylvanica* Muhl.

Common in swamps at Great Falls; in a creek at Forest Glen.

63. *Dentaria heterophylla* Nutt.

Common in the woods from Sandy Landing to Great Falls.

\*64a. *Dentaria diphylla* L.

Rocks at Glen Echo Junction. In flower first week of April.

\*64b. *Sisymbrium altissimum* L.

Near Eckington, along Florida Avenue. E. L. Greene.

71. *Erysimum cheiranthoides* L.

River-shore near mouth of Scott's Run.

72. *Camelina sativa* Crantz.

Not uncommon in Brookland, along the railroad track and in vacant

78. *Thlaspi arvense* L.

Along the road near Great Falls' Hotel; a few specimens on a lawn in Brookland.

86. *Viola villosa* Walt.

Very abundant in the woods at Forest Glen; not uncommon in sandy or gravelly soil near Terra Cotta, Soldiers' Home and Brookland.

86a. *Viola affinis* Le Conte.

Very common in shaded woods and swamps, for instance near Eckington, the Reform School, Riggs' Mill, Marshall Hall, etc.

86b. *Viola papilionacea* Pursh.

Common in deciduous forests.

**\*87a. *Viola emarginata* Le Conte.**

Not rare in sandy soil, open woods or hill-sides, for instance near Eckington, Terra Cotta, Riggs' Mill, Sligo, etc.

**87b. *Viola ovata* Nutt.**

Very common in sandy soil, for instance near Soldiers' Home, Hyattsville, Sandy Landing, etc.

**90. *Viola striata* Ait.**

Sandy Landing.

**100. *Polygala ambigua* Nutt.**

In sandy soil near Riggs' Mill; dry fields near Marshall Hall.

**100a. *Polygala verticillata* L.**

Abundant near the Reform School; dry fields near Marshall Hall.

**\*100b. *Polygala Nuttallii* T. & G.**

In thickets of *Azalea* and *Andromeda* near Terra Cotta; in flower second week of June.

**106. *Silene nivea* D. C.**

Along West Branch near Hyattsville; woods near Surattsville.

**\*115a. *Stellaria neglecta* Whe.**

In the woods near Chain Bridge, Va.

**\*118a. *Arenaria Michauxii* Hook.**

Rocks at Great Falls. G. H. Hicks.

**124. *Paronychia dichotoma* Nutt.**

On rocks at Great Falls, Md.

**\*129a. *Hypericum densiflorum* Pursh.**

Swamps in woods near Surattsville.

**138a. *Sida Napæa* Cavan.**

At the south end of Long Bridge, quite common.

**145. *Linum striatum* Walt.**

Meadow near Sligo.

**192. *Melilotus officinalis* Willd.**

New York avenue near the railroad station; Navy Yard.

**195a. *Trifolium hybridum* Savi.**

Found in many places, especially in the northeastern section.

**\*199a. *Trifolium minus* Sm. (*T. filiforme* D. C. non L.)**

On grassy slopes at Marshall Hall.

**216. *Desmodium ciliare* D. C.**

Common near Hyattsville; Sligo.

**217. *Desmodium Marylandicum* Boott.**

Near Highland; along the roads near Great Falls, on the Maryland side.

**220a. *Lespedeza striata* L.**

Common near Great Falls, Md.; near Cabin John Bridge; along Bunke Hill road near Catholic University.

**221. *Lespedeza Stuvei* Nutt.**

Low meadow-land near Hyattsville; near Soldiers' Home.

225. *Vicia tetrasperma* Loisel.  
Meadow near Terra Cotta.
230. *Clitoria Mariana* L.  
Sligo avenue and Rappley road near Takoma.
- 234a. *Phaseolus diversifolius* Pers.  
Along Sargent road near Terra Cotta.
234. *Phaseolus perennis* Walt.  
River-shore at Marshall Hall.
257. *Rubus cuneifolius* Pursh.  
Fort Totten. E. L. Greene.
- \*264a. *Potentilla reptans* L.  
Near Brightwood. E. L. Greene.
267. *Alchemilla arvensis* Scop.  
Along the road between Chain bridge and High Island.
270. *Poterium Canadense* B. & H.  
Swamp near Hyattsville.
285. *Crataegus parvifolia* Ait.  
Sandy Landing.
291. *Chrysosplenium Americanum* Schwein.  
Forest Glen; at a spring in the woods near Great Falls, Md.
- 304a. *Callitriche Austini* Engelm.  
Woods near Soldiers' Home.
- 306a. *Rhexia Mariana* L.  
Not uncommon in swamps between Hyattsville and Highland, near Reform School; woods at Marshall Hall.
- 307a. *Ammannia humilis* Michx.  
Old river bottom near Hyattsville; swamps near the tow-path at Great Falls; common in wet places in the woods at Marshall Hall.
- 316a. *Oenothera pumila* L.  
Dry fields near Highland.
- 317a. *Oenothera sinuata* L.  
Abundant in a low meadow near the Reform School.
327. *Hydrocotyle ranunculoides* L.  
Swamp near Marshall Hall.
332. *Erigenia bulbosa* Nutt.  
River shore at Great Falls, Md.
- 333a. *Cicuta bulbifera* L.  
In the canal at Great Falls.
- 338a. *Scandix pecten-veneris* L.  
Seabrook, Md. Walter H. Evans.
349. *Aralia spinosa* L.  
Along the Walker road between Camp Spring P. O. and Surattsville.
351. *Aralia nudicaulis* L.  
Woods near Surattsville.

**351a. *Aralia quinquefolia* Decne. & Planch.**

Several fruiting specimens were found in a ravine near the mouth of Scott's Run, Va., first week of July, 1898.

**\*356a. *Cornus circinata* l'Her.**

Dodge's Mill. Conant, 1883. Reported by Dr. Walter H. Evans.

**385. *Fedia Fagopyrum* Torr. & Gr.**

Low thickets at Sandy Landing.

**386. *Fedia radiata* Michx.**

Low thickets at Marshall Hall.

**387. *Dipsacus sylvestris* Mill.**

Great Falls, Md.

**391a. *Eupatorium altissimum* L.**

Terra Cotta swamp.

**\*391b. *Eupatorium linearifolium* Michx.**

Woods near Marshall Hall. E. L. Greene.

**399. *Eupatorium ageratoides* L.**

A form with cordate leaves and very large, open inflorescence occurs in the woods near Seven Locks and High Island.

**402. *Mikania scandens* L.**

Along a creek near Highland; near Arlington; near Seven Locks.

**414a. *Solidago racemosa* Greene.**

On the rocks at Great Falls, Md.

**426. *Sericocarpus solidagineus* Nees.**

Fort Totten; along Bates' road.

**450. *Diplopappus umbellatus* Torr. & Gr.**

Terra Cotta swamp; near Riggs' Mill.

**457a. *Pluchea camphorata* D. C.**

Still to be found at Marshall Hall, in open places in the woods.

**458. *Filago Germanica* L.**

Pastures near Marshall Hall.

**459b. *Antennaria neglecta* Greene.**

Very common in moist meadow lands, and has been collected in numerous places between Marshall Hall and Great Falls.

**\*459c. *Antennaria alsinoides* Greene.**

Rather rare. Sand hills near Terra Cotta. E. L. Greene. Bunker Hill; Forest Glen; Great Falls, Md.; Marshall Hall. Only the pistillate plant is known of this species.

**459d. *Antennaria decipiens* Greene.**

Common in pine woods and *Andropogon* fields. Collected in many places between Washington and Great Falls.

**459e. *Antennaria fallax* Greene.****459f. *Antennaria arnoglossa* Greene.**

These two species grow mostly together in dry woodlands, and pistillate plants have been found in many places between Washington and

Great Falls. The staminate plants appear to be rare, those of *A. fallax* being recorded only from Brookland, Terra Cotta and Forest Glen, while the male plant of *A. arnoglousa* has been found on Bunker Hill and at Sandy Landing.

**461. *Gnaphalium uliginosum* L.**

Old river bottom near Hyattsville; wet places in the woods at Marshall Hall.

**473. *Eclipta procumbens* Michx.**

Common along the canal at Great Falls; swamp near Marshall Hall; on the Potomac shore near Aqueduct bridge, Virginia side; Brookland.

**475. *Rudbeckia triloba* L.**

On the river shore at Seven locks; woods near Great Falls, Md.; Chevy Chase.

**479. *Hellanthus angustifolius* L.**

Swamp between Nork and Fort Myer.

**492. *Coreopsis tripteris* L.**

Rocks at Great Falls, Md.; woods at Seven locks.

**\*462a. *Coreopsis bidentoides* Nutt.**

In the canal near Sandy Landing.

**494a. *Bidens connata* Muhl.**

Old river bottom near Hyattsville; not uncommon in swamps around Eckington and Brookland with the var. *comosa* Gr.

**\*494b. *Bidens vulgata* Greene.**

Near Terra Cotta. E. L. Greene. Several places in Brookland and near Eckington.

**\*496b. *Bidens lugens* Greene.**

River bottom near Marshall Hall; abundant in swamps near Anacostia. E. L. Greene.

**497a. *Galinsoga parviflora* Cavan.**

Eckington near R street

**502c. *Artemisia vulgaris* L.**

A single specimen was found in a dry field near Hyattsville.

**503. *Arnica nudicaulis* Ell.**

Woods between Eckington and Michigan avenue. E. L. Greene. Forest Glen.

**\*526a. *Taraxacum corniculatum* Kit. (*T. erythrospermum* Andr.).**

In sandy or gravelly soil, not uncommon in woods near Soldiers' Home; it occurs also in lawns, Brookland and Catholic University.

**\*536a. *Sonchus arvensis* L.**

Lawns at Catholic University.

**\*536b. *Leontodon autumnalis* L.**

With the preceding.

**551. *Gaultheria procumbens* L.**

Wooded hill-sides at Sligo avenue and Rappley road near Takoma.

- 558. *Rhododendron viscosum* Torr., var. *glaucum* Gr.**  
**559. *Rhododendron vicosum* Torr. var. *nitidum* Gr.**  
 Abundant in the woods near Forestville and Surattsville.
- 565. *Pyrola chlorantha* Sw.**  
 Pine woods near mouth of Scott's Run, Va.; ravines at Sligo avenue.
- 570. *Dodecatheon Meadia* L.**  
 Glen Echo junction.
- 572. *Steironema lanceolatum* Gr.**  
 Ditch near Marshall Hall.
- 576. *Lysimachia stricta* Ait.**  
 Meadow near Hyattsville.
- 577. *Lysimachia nummularia* L.**  
 Along Harewood avenue near Soldiers' Home.
- 577a. *Centunculus minimus* L.**  
 Old river bottom near Hyattsville, in fruit last week of June.
- 578. *Anagallis arvensis* L.**  
 Pastures near Marshall Hall; lawns at Catholic University.
- 585b. *Apocynum medium* Greene.**  
 River shore at Marshall Hall. E. L. Greene.
- 589. *Asclepias rubra* L.**  
 Deanwood swamp. Thos. H. Kearney, Jr.
- 596. *Asclepias quadrifolia* Jacq.**  
 Near Fort Totten. E. L. Greene.
- \*601b. *Polypremum procumbens* L.**  
 A single specimen was found on the road-side in the woods near Marshall Hall. E. L. Greene. In fruit second week of August.
- 606. *Bartonia tenella* Muhl.**  
 Deanwood swamp. Thos. H. Kearney, Jr.
- 614a. *Hydrophyllum Canadense* L.**  
 Ravine near mouth of Scott's run, Va.; damp, shaded places among rocks near Sandy Landing.
- 615. *Ellisia Nyctelea* L.**  
 Abundant along the tow-path near Great Falls.
- 634. *Ipomæa lacunosa* L.**  
 Arlington estate; on rocks at Great Falls, Md.
- 636. *Convolvulus sepium* L. var. *Americanus* Sims.**  
 Low grounds on Bunker-hill road.
- 637. *Convolvulus arvensis* L.**  
 Vacant lots on First street near N. Y. avenue; Navy Yard.
- 646. *Lycium vulgare* Dun.**  
 Along the road near Henson's Creek.
- 653. *Linaria Elatine* Mill.**  
 Grassy slopes at Marshall Hall; along Brentwood road near Brookland.



**654. *Scrophularia nodosa* L.**

Along the tow-path near Great Falls; ditch near Hyattsville; Marshall Hall.

**663. *Ilysanthes gratioloides* Benth.**

Not common; old river bottom near Hyattsville; swamp near Henson's Creek.

**\*663a. *Ilysanthes attenuata* (Muhl.) Small.**

Common along creeks.

**667. *Veronica scutellata* L.**

Muddy creek bottom near Marshall Hall.

**669a. *Veronica agrestis* L.**

Lawns of the Catholic University.

**\*699b. *Veronica Chamædryas* L.**

Near Soldiers' Home.

**672. *Buchnera Americana* L.**

Club-house woods near Great Falls, Md.

**\*677a. *Gerardia decemloba* Greene.**

Low grounds in Brookland near Bunker Hill; swamp near the Reform School; in bloom second week of September.

**\*677b. *Gerardia Holmiana* Greene.**

Wooded banks along Michigan avenue, opposite Soldiers' Home grounds; Brookland; Terra Cotta; in bloom second week of October.

**\*680. *Melampyrum latifolium* Muhl.**

In sandy soil in woods near Riggs' Mill.

**680. *Melampyrum Americanum* Michx.**

Ravines near Sligo avenue and Rappley road near Takoma.

**\*686a. *Utricularia subulata* L.**

Swamps in the woods near Surattsville. G. W. Oliver. In flower first week of September.

**712. *Pycnanthemum lanceolatum* Pursh.**

Terra Cotta.

**\*723a. *Monarda clinopodia* L.**

Ravine near mouth of Scott's Run, Va. In flower first week of July.

**732a. *Scutellaria parvula* Michx.**

Woods at northeast corner of Soldier's Home grounds; near Marshall Hall.

**738a. *Lamium purpureum* L.**

Capitol grounds. E. L. Greene.

**745. *Plantago Patagonica* Jacq. var. *aristata* Gray.**

Common near Hyattsville and many other places in the District.

**\*748a. *Amaranthus chlorostachys* Willd.**

Near the Navy Yard, with flowers second week of July.

**749. *Amaranthus albus* L.**

Along the railroad track near University Station; gardens in Brookland.

- 768. *Polygonum hydrophiloides* Michx.**  
Old creek-bottom near Marshall Hall.
- \*778a. *Polygonum cristatum* Engelm.**  
Rocks near Great Falls, Md.; thickets near Hyattsville; common near Seven Locks. With flower and fruit third week of September.
- 788. *Aristolochia Serpentaria* L.**  
Abundant in ravines near Marshall Hall; ravines at Sligo avenue and Rappley road near Takoma.
- 796a. *Euphorbia hirsuta* Wieg.**  
Rocks at Great Falls, Md.; woods near Marshall Hall.
- 800. *Euphorbia commutata* Eng.**  
Common in rocky woods from Sandy Landing to Great Falls.
- 801. *Phyllanthus Carolinensis* Walt.**  
Old river bottom near Hyattsville; not uncommon in the woods at Great Falls, Md.; woods near Marshall Hall.
- 812. *Urtica dioica* L.**  
Not common. Along the tow-path near Great Falls.
- 830. *Corylus Americana* Walt.**  
Abundant near Sligo; South Brookland near the railroad track.
- 849. *Quercus heterophylla* Michx.**  
Several trees, but all sterile, were found in the woods at Marshall Hall.
- 901. *Habenaria tridentata* Hook.**  
Woods near Great Falls, Md.; very abundant in swamps near Surattsville.
- 903. *Habenaria ciliaris* R. Br.**  
Swamp near Bladensburg turnpike, south of the Reform School. G. W. Oliver.
- 904. *Habenaria lacera* R. Br.**  
Swamp near the Reform School; several places in Brookland; Terra Cotta swamp; swamps near Marshall Hall.
- 909. *Spiranthes gracilis* Big.**  
Woods along Scott's Run, Va.
- 910. *Spiranthes simplex* Gr.**  
Woods near Great Falls, Md.; Terra Cotta; Brookland.
- 912. *Pogonia verticillata* Nutt.**  
Swamp near Bladensburg. Thos. H. Kearney, Jr. Abundant on the sand hills around Fort Totten; damp woods near the Reform School; swamps near Surrattsville.
- 913. *Calopogon pulchellus* R. Br.**  
Deanwood swamp. Thos. H. Kearney, Jr. Swamp near Surattsville.
- 915. *Microstylis ophioglossoides* Nutt.**  
Woods near Marshall Hall; woods near Great Falls, Md.

**925. *Aletris farinosa* L.**

Fort Totten. E. L. Greene. Very common in the open woods south of the Reform School.

**939. *Allium tricoccum* Ait.**

Rocks at Great Falls, Md.

**947. *Majanthemum Canadense* Desf.**

Near the Reform School. G. W. Oliver. Abundant in the woods at Surattsville.

**957. *Veratrum viride* Ait.**

Woods near Surattsville.

**962. *Muscari botryoides* Mill.**

Rocks at Sandy Landing.

**970. *Juncus bufonius* L.**

Apparently not rare and found in several places; near Kenilworth; Bladensburg; Highland; Riggs' Mill; Takoma; Brookland; Marshall Hall.

**982. *Commelina hirtella* Vahl.**

River shore at Marshall Hall; Four Mile Run.

**982a. *Commelina Virginica* L.**

Rocks at Great Falls, Md.

**985. *Xyris flexuosa* Muhl.**

Swamp south of the Reform School; the Lydecker basin.

**986. *Eriocaulon decangulare* L.**

Swamps near Surattsville.

**986c. *Cyperus flavescens* L.**

Evidently common and found in many places, for instance: Terra Cotta swamp; along creeks on Bunker Hill road; at a spring on Arlington estate; abundant in swamp between Nork and Fort Myer; near Alexandria.

**987. *Cyperus diandrus* Torr.**

The specimens recorded in Professor Ward's List do not belong to this species, but to *C. ricularis* Kunth.

**\*987a. *Cyperus rivularis* Kth. var. *eluta* Clarke.**

With the type and equally common.

**990. *Cyperus erythrorhizos* Muhl.**

At a spring on Arlington estate; swamp near Marshall Hall.

**991. *Cyperus calcaratus* Nees.**

Swamps near the canal at Great Falls.

**999a. *Kyllinga pumila* Michx.**

Several places near Marshall Hall, in the woods.

**1000. *Fulrena squarrosa* Michx.**

Abundant in the Lydecker basin.

**1003a. *Eleocharis olivacea* Torr.**

The Lydecker basin.

**1004a. *Eleocharis intermedia* Schult.**

Wet places along Rappley road near Takoma; exceedingly common in swamps near Marshall Hall.

**1007. *Scirpus planifolius* Muhl.**

Common on the sand hills around Fort Totten; Forest Glen.

**1010. *Scirpus debilis* Pursh.**

Along Bunker Hill road.

**\*1018a. *Fimbristylis laxa* Vahl.**

Abundant in low meadow-land near Hyattsville. In flower second week of August.

**1019. *Fimbristylis capillaris* Gr.**

On dry rocks at Great Falls, Md.

**1019a. *Rhynchospora fusca* R. & S.**

Swamp between Nork and Fort Myer.

**\*1020a. *Rhynchospora gracilentia* Gr.**

Swamps near Surattsville.

**\*1020b. *Rhynchospora cymosa* Ell.**

Swamps south of the Reform School.

**1021a. *Rhynchospora cephalantha* Gr.**

Along Queen's Chapel road; Lydecker basin; Arlington estate; Terra Cotta swamp.

**1021b. *Rhynchospora macrostachya* Torr.**

Swamp in the woods at Marshall Hall.

**1024. *Scleria pauciflora* Muhl.**

Swamp south of the Reform School.

**1024a. *Scleria reticularis* Michx.**

Deanwood swamp. Thos. H. Kearney, Jr. Swamp between Nork and Fort Myer; near Surattsville.

**1026. *Carex Willdenovii* Schk.**

Common in the woods at Marshall Hall; Sandy Landing; Great Falls, Md.

**1027. *Carex Steudelii* Kth.**

Sandy Landing; Great Falls, Md.

**1035a. *Carex Muhlenbergii* Schk. var. *enervis* Boott.**

In dry, sandy soil near Terra Cotta; dry fields at Marshall Hall.

**\*1038a. *Carex stellulata* L. var. *cephalantha* Bail.**

Terra Cotta swamp.

**1051. *Carex Shortiana* Dew.**

Near the river shore at Marshall Hall.

**1054. *Carex granularis* Muhl.**

Not common. Along the canal at Great Falls.

**1055. *Carex glaucoidea* Port.**

Near Hyattsville; Fort Totten; very common in the woods at Marshall Hall.

- 1058a. *Carex grisea* Wahlbg. var. *angustifolia* Boott.**  
The Zoological Park.
- 1064. *Carex Careyana* Torr.**  
High Island.
- 1065. *Carex laxiculmis* Schw. (*C. retrocurva* Dew.)**  
Woods near Great Falls, Md.
- 1068. *Carex laxiflora* Lam. var. *styloflexa* Boott.**  
Terra Cotta swamp.
- \*1072c. *Carex laxiflora* Lam. var. *varians* Bail.**  
Bunker Hill; the Smithsonian Park; the Virginia shore near Aqueduct bridge.
- 1075. *Carex umbellata* Schk.**  
Exceedingly common on the sand hills around Terra Cotta and Fort Totten; Sandy Landing.
- 1077. *Carex nigro-marginata* Schw.**  
Grassy banks along Rappley road near Sligo; Bunker Hill; on rocks at Great Falls near the canal.
- 1081. *Carex prasina* Vahl.**  
Forest Glen.
- \*1092a. *Carex typhinoides* Schwein.**  
Low thickets near Hyattsville.
- 1101. *Vilfa aspera* Beauv.**  
Rocks at Great Falls, Md.
- 1101a. *Vilfa vaginaeflora* Vasey.**  
Common in the city, in lawns, vacant lots, etc.; along roads near Hyattsville, Highlands, Great Falls, etc.
- 1104a. *Agrostis elata* Trin.**  
Evidently common in woods, and has been found in many localities besides those already recorded: near Chevy Chase; Cabin John; Great Falls, Md., etc.
- 1112. *Muhlenbergia capillaris* Kth.**  
Very abundant forming large patches on the rocks at Great Falls, Md., October, 1899.
- 1119. *Aristida purpurascens* Poir.**  
On dry rocks at Great Falls, Md.; near Hyattsville.
- \*1124a. *Tricuspis seslerioides* Torr. var. *pallida* Holm, n. var.**  
A form with pale green spikelets; with the type near Marshall Hall.
- 1125a. *Eatonia obtusata* Gr.**  
Low grounds near the Reform School.
- 1126a. *Eatonia Dudleyi* Vasey.**  
In woods at Scott's run, Va.; Sandy Landing.
- 1129. *Glyceria laxa* Scribner.**  
Still abundant in the Terra Cotta swamp (Aug., 1900).

**1130. *Glyceria fluitans* R. Br.**

Ditch near Hyattsville.

**\*1130a. *Glyceria obtusa* Trin.**

Damp places in the woods near Surattsville.

**1139. *Eragrostis reptans* Nees.**

Along the tow-path at Great Falls; wet places along the roads in the woods at Marshall Hall.

**1140. *Eragrostis minor* Host. (*E. poaeoides* Beauv.)**

Along the railroad track near University Station; along the tow-path at Seven locks.

**1142. *Eragrostis Frankii* Mey.**

Along the tow-path near Great Falls; in the woods near Marshall Hall; vacant lots in Brookland.

**1143. *Eragrostis Purshii* Schrad.**

Roadsides in Brookland; near Highland; Hyattsville; very common near Great Falls; near Cabin John Bridge.

**1146. *Festuca Myurus* L.**

Woods south of the Reform School; along the railroad track at Landon station.

**1156. *Bromus sterilis* L.**

Brookland; New York avenue near Eckington.

**1158. *Uniola gracilis* Michx.**

Arlington estate; Takoma.

**1166a. *Danthonia sericea* Nutt.**

Many specimens were collected along the electric railroad track near Highland.

**1169. *Aira caryophyllea* L.**

Common along the road between Chain Bridge and Scott's Run, Va.; in dry fields near Surattsville; near the Reform School.

**1178. *Panicum agrostoides* Spreng.**

Swamp near Marshall Hall.

**\*1180b. *Panicum Philadelphicum* Bernh. (*P. capillare* L. var. *flexile* Gatt.)**

Along Rappley road near Glen Sligo. In flower first week of October.

**1183a. *Panicum commutatum* Schult.**

Soldiers' Home grounds; Forest Glen; High Island; Sandy Landing; Takoma.

**1185. *Panicum microcarpon* Muhl.**

Evidently common in open woods, and has been collected in several places between Washington and Great Falls on the Maryland side.

**1187. *Panicum laxiflorum* Lam. (*P. pauciflorum* Ell. in Prof. Ward's list.)**

The commonest species of *Panicum* in the woods at Great Falls, Md.

- 1187a. *Panicum sphærocarpon* Ell.**  
Woods near Riggs' Mill; Terra Cotta swamp; Chevy Chase; dry fields near Hyattsville and the Reform School.
- 1188a. *Panicum ramulosum* Michx.**  
Terra Cotta swamp.
- 1188b. *Panicum nitidum* Lam.**  
Old river bottom near Hyattsville; Terra Cotta swamp.
- 1188c. *Panicum lanuginosum* Ell.**  
Woods at Forest Glen; Fort Totten.
- \*1189a. *Panicum linearifolium* Scribn.**  
Plummer's Island. Thos. H. Kearney, Jr.
- 1192. *Panicum Crus-galli* L. var. *hispidum* Gr.**  
In the canal at Great Falls.
- 1196. *Cenchrus tribuloides* L.**  
Near Seven locks; along roads at Marshall Hall.
- 1203. *Andropogon macrourus* Michx.**  
Sphagnum swamps near Surattsville.
- 1220. *Woodwardia virginica* Sm.**  
Common near Surattsville. Wm. R. Maxon.
- \*1222a. *Asplenium pinnatifidum* Nutt.**  
Two miles below Scott's Run on Virginia shore of Potomac. Wm. Palmer and Wm. R. Maxon.
- \*1222b. *Asplenium ebenoides* R. R. Scott.**  
Plummer's Island. Wm. Palmer. A single specimen.
- 1223. *Asplenium angustifolium* Michx.**  
Ravines between Marshall Hall and the Piscataway; western end of Massachusetts avenue bridge and Rock Creek. Wm. Palmer. Abundant along brooks in woodlands of the Potomac bluffs near Langley, Va. Wm. R. Maxon.
- 1226. *Camptosorus rhizophyllus* Link.**  
Plummer's Island. D. LeRoy Topping. Several situations on rocky cliffs of the Virginia shore of the Potomac opposite Langley. Wm. R. Maxon.
- 1230. *Aspidium cristatum* Swtz.**  
In the Lygodium swamp about two miles to the northwest of Riverdale, Md. Wm. Palmer and Wm. R. Maxon. Woods near Great Falls, Md.; near the spring-house, Takoma.
- 1236. *Cystopteris fragilis* Bernh.**  
Common in ravines north of Marshall Hall; Potomac Landing, Alexandria County, Va. Wm. Palmer. Near Sandy Landing.
- \*1236a. *Cystopteris bulbifera* (L.) Bernh.**  
On the Virginia shore of Potomac nearly opposite Langley, Va. Wm. Palmer and Wm. R. Maxon. Recorded in Flora Columbiana, Field and Forest. Vol. I, 1875, but with no locality.

**\*1237a. *Onoclea Struthiopteris* (L.) Hoffm.**

Frequent along the alluvial portions of the Potomac on the Virginia side one to two miles above Cabin Johns. Several collectors.

**1242. *Osmunda Claytoniana* L.**

Between West Chevy Chase and Glen Echo Junction. Wm. R. Maxon.

**1245. *Botrychium ternatum* Swtz. var. *dissectum* Milde.**

Woods near Great Falls, Md.

**1247. *Ophioglossum vulgatum* L.**

Grassy roadside bank, Upper Marlboro, Md. Wm. R. Maxon. Woods at Marshall Hall; at the foot of Fort Totten.

**1248. *Lycopodium lucidulum* Michx.**

In dry woods near Cleveland Park. Wm. R. Maxon and C. L. Polard. Ravines near Marshall Hall.

**1249. *Lycopodium dendroideum* Michx.**

Woods near Surattsville.

**1253. *Selaginella apus* Spring.**

Has been found in many places between Marshall Hall and Great Falls, Md., and is evidently not uncommon.



PROCEEDINGS  
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GENERAL NOTES.

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The subgenus *Rhinosciurus* of Trouessart.\*

In the 'Catalogus Mammalium' (p. 410) Trouessart unites the *Sciurus laticaudatus* of Müller and Schlegel and the *S. davidianus* of A. Milne-Edwards to form the subgenus *Rhinosciurus*† placed at the end of the genus *Xerus*. Material in the United States National Museum shows that the two species are not congeneric, and that neither is closely related to *Xerus*. The genus *Rhinosciurus* (type *R. tupaoides* Blyth‡) is strikingly characterized by its greatly elongated, cylindric, *Tupaia*-like skull and small, slender incisors. The lower incisors are set more nearly in line with the mandibular ramus than in other squirrels, and the upper incisors are so small that in a skull 50 mm. in basal length they scarcely equal those in a skull of *Sciuropterus volans* only 27 mm. long. The '*Xerus*' *davidianus* on the other hand has a skull practically identical with that of the Chinese *Eutamias senescens*, though much larger. Indeed the agreement with *Eutamias* in both cranial and dental characters appears to be complete. Externally, however, the animal resembles *Sciurus* in its well-haired, bushy tail and in the absence of stripes on the body. It also diverges from *Eutamias* in the direction of *Sciurus* in the reduction of the capacity of the cheek pouches. As the animal can therefore be properly referred to none of the recognized groups it may be made the type of a new genus *Sciurotamias*.—Gerrit S. Müller, Jr.

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†First used by Gray in 1843 (List Mamm. Brit. Mus. p. 195) for a genus with *B. tupaoides* from Singapore as the type. Both generic and specific names are nomina nuda and must date from their earliest definition. The former was properly published by Gray in 1867 (Am. and Mag. Nat. Hist., 3d ser. XX, p. 286), the latter by Blyth in 1855 (Jour. Asiat. Soc. Bengal, XXIV, p. 477) as *Sciurus* *tupaoides*, type locality Malacca.

‡The relationship of this animal to the Bornean *Rhinosciurus laticaudatus* given by Thomas (Proc. Zool. Soc. London, 1897, p. 933) as type of the subgenus is not fully understood.

### On the name *Vespertilio blossevillei*.

In a recent note on the systematic name of the Cuban Red Bat, Dr. J. A. Allen falls into a very natural error in assuming that the "abstract" in Férussac's Bulletin, entitled "Mammifères nouveaux ou peu connus décrits et figurés dans l'Atlas zoologique du Voyage autour du monde de la corvette la Coquille," etc., was published after the appearance of the Zoology of the 'Coquille'. As a matter of fact, the Zoology of the voyage of the 'Coquille' appeared in livraisons, beginning with October, 1826; and tome I, pt. I, while dated "1826", was really published between 1826 and 1828, the preface actually bearing the date January, 1828. No descriptive matter appeared before 1827, but plates were issued with the separate parts, and the names on them will stand, except in those cases where an earlier description occurs in Férussac's Bulletin. In the case of *Vespertilio blossevillei*, the name dates from Férussac's Bulletin, VIII (not XIII, as misprinted in the note above mentioned), May, 1826, p. 95, while the earliest reference to *Vespertilio bonariensis* is plate II, fig. 1, Zool. "Coquille," which appeared in livr. 3 of that work, published in April, 1827. It will be plain, from the above, that *Lasiurus blossevillei*, and not *L. bonariensis* is the correct name of the Uruguayan species.—Chas. W. Richmond.

### The name of the Aard-Vark.

In advocating the name *Orycteropus afra* (Pall.) for the Aard-Vark (Proc. Biol. Soc. Wash., XIII, p. 166) Mr. Rehn has omitted to notice (1) that *afra* is the feminine of a declinable adjective, and that the masculine, in agreement with *Orycteropus*, should be *afēr*, and (2) that the combination *Orycteropus afer* has already been occasionally used in Zoology, e. g. P. Roy. Soc. XLVII, p. 246 (1890), and P. Z. S., 1897, p. 939. In neglect of the first point, *O. afra* has also been used by Flower and Lydekker (Mamm. p. 211, 1891).—Oldfield Thomas.

### The name of the Ogotona.

Mr. Rehn has changed into *r*, Pallas' first *u* in *Lepus dauuricus*. As the name comes from the country of the Daurien (as Pallas calls them) the letter is clearly not a *r* printed as a *u*, as is often the case in old works. In addition, the generic name having a feminine termination, the adjectival specific name should also be feminine. The proper name should therefore be, not Mr. Rehn's "*Ochotona dauuricus*" but *Ochotona dauurica*.—Oldfield Thomas.

### The name of the Viscacha.

In suggesting the name *Viscaccia* (Brandis, 1786, ex Molina) for "the Viscacha" Mr. Rehn has confused two perfectly different animals. Molina's "Viscaccia" is the Chilian *Lagidium*, while the Viscacha of modern writers is the Argentine *Lagotomus* (using for the moment the best known names for each). Furthermore, there is no need to drag in the translator Brandis, as in the 1782 edition of his *Saggio*, (p. 307) Molina himself properly describes and names "La Viscaccia, *Lepus Viscacia*" by which term he clearly means the *Lagidium* of Chili.

*Lagidium viscacia* Mol. is probably the proper name for the latter animal, but the question is so intricate, partly owing to the confused use of the two names Viscacha and Chinchilla for members of the three genera *Lagotomus*, *Lagidium* and *Chinchilla*, and partly in the doubt as to what animal the name *Cullomys* Goff. will be applied to by eliminators and others, that I do not like to risk making confusion worse confounded by definitely asserting its validity.

The pertinence of the generic name "*Viscacia*" to the Argentine Viscacha has been shown by Mr. Palmer (*Science*, N. S., VI, p. 21, 1897), though owing to the doubt\* as to the date of its publication in Schinz's *Naturgeschichte*, the following reference may be taken as the first: *Viscaccia*, Schinz, Cuvier's *Thierreich* IV, p. 429 (1825). The difference in the spelling should be noted.

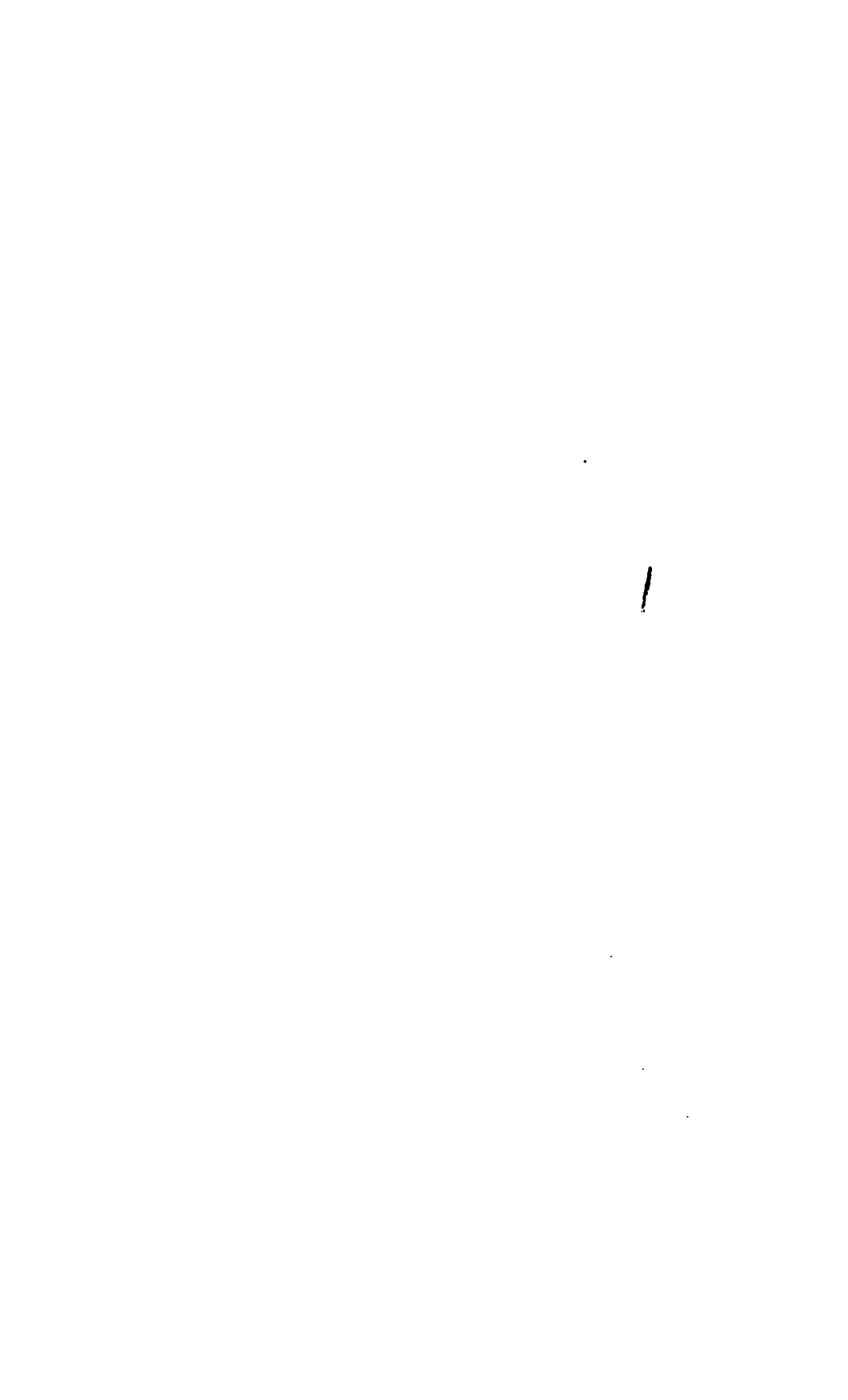
Curiously enough as a foretaste of the eternal Chili-Argentine confusion, Schinz heads the reference "*Viscaccia* Molina," but his enumeration of the digits, 4-3, and his measurements (taken from Azara) of *V. americana* are clearly diagnostic of the Argentine animal.—*Oldfield Thomas*.

### A correction of *Vernonia gigantea pubescens*.

Through a misapprehension of the case the subspecies *pubescens* was referred (*Proc. Biol. Soc. Wash.* 13: 179, October, 1900) to *Vernonia gigantea* of the Atlantic seaboard, which does not occur in the Alleghenies or westward. The species so common throughout the latter range is *V. maxima* Small (*Bull. Torr. Bot. Club*, 27: 280, May, 1900). Hence the name of the subspecies collected near Baileysville, West Virginia, is *Vernonia marima pubescens*.—*E. I. Morris, Dept. Biol., Washington High Schools*.

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\*Probably not published before 1825 or 1826 (Palmer).



PROCEEDINGS  
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A NEW SPINY RAT FROM LA GUAIRA,  
VENEZUELA.

BY OLDFIELD THOMAS.

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A spiny rat collected at La Guaira, Venezuela, by Messrs. Wirt Robinson and M. W. Lyon, Jr. and submitted to me for determination proves to differ from the previously described species. It may be known as:

*Proechimys gualæ*, sp. n.

Allied to *P. trinitatis*, but less richly rufous in color.

Size rather less than in *P. trinitatis*. Spines evenly mixed with the dorsal hair, and of about the same prominence on the back; an average spine measures 23 mm. in length by about two-thirds of a millimeter in breadth. General color above much paler than in the allied species, more similar to that of the Ecuadorean *P. decumanus* Thos.; pale rufous heavily lined on the back with the black tips to the spines, laterally clearer but still rufous, the hairs indistinctly annulated with brown. Face greyer than back. Fine hairs of ear black, some longer black hairs at its base anteriorly. Under surface white, pure on the chest and belly, buffy on the throat and along a narrow indistinctly defined line edging the color of the flanks. Upper surface of hands and feet white, indistinctly browner along the outer edge of the metapodials. Tail well haired, black above and white below.

Skull very like that of the smaller mainland form of *P. trinitatis* (*P. urichi* Allen), but more heavily built and without the peculiar slenderness of muzzle that characterizes that animal. Supraorbital ridges heav-

ily developed, but abruptly ceasing at the fronto-parietal suture, the parietal itself being quite smooth. Pterygoid processes broadly spatulate. Palatal foramina large, the posterior ends continued backward as two gutters on to the front of the palate. Bullæ small, their antero-posterior length measured laterally into the angle formed by the paroccipital process, only 9.4 mm.

Dimensions of the type measured in the flesh:

Head and body, 240; tail, 190; hind foot, s. u. 45, c. u. 48.

Skull, greatest length, 56; basilar length, 39.2; zygomatic breadth, 27; nasals, length, 20.4; breadth of muzzle at fronto-premaxillary suture, 10; interorbital breadth, 13.1; breadth on ridges above squamosals, 19.3; interparietal, 8.5 x 13.7; diastema, 12; palate from henselion, 19; palatal foramina, 7.5 x 3.7; length of upper tooth series, 8.7.

*Hab.* La Guaira, Venezuela.

*Type.* Male. U. S. N. M., No. 102,731. Original number 81. Collected 8th July, 1900 by Messrs. Lyon and Robinson. A paratype in British Museum, No. 1.1.5.3, presented by the United States National Museum.

This species is evidently closely allied to *P. trinitatis* and its continental representatives of *P. urichi* and *P. minca*. It differs from all three by its much paler color, and from the first and second by its nearly white feet.

From *P. centralis* and allies it is also separated by the absence of parietal ridges, in which respect it approaches the Peruvian *P. simonsi*.

The paratype is rather more brown and less rufous than the type, suggesting a specimen in a rather more youthful state of pelage.

PROCEEDINGS  
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TWO NEW BIGHORNS AND A NEW ANTELOPE FROM  
MEXICO AND THE UNITED STATES.

BY C. HART MERRIAM.

In the course of field work in Mexico in 1899, Mr. E. W. Nelson, a field naturalist of the U. S. Biological Survey, and his able assistant Mr. E. A. Goldman, secured a series of eight Mountain Sheep or Bighorns in the barren desert mountains about Lake Santa Maria, Chihuahua. Comparison of these specimens with their nearest allies, *Ovis nelsoni* and *O. canadensis*\*, shows that they differ specifically from either. The new species may be known as follows:

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\*The type locality of the northern Bighorn, *Ovis canadensis* Shaw, is the Rocky Mountains of Alberta, Canada. The Biological Survey has secured topotype material from this region (collected by J. Alden Loring) which has been used in the comparisons on which the present paper is based.

Respecting the priority of the name *canadensis* Shaw (1803), over *cervina* Desmarest (1804), it may be stated that both Bolton (Cat. Sci. Periodicals, p. 624, 1885) and Sherborn (Ann. and Mag. Nat. Hist. 6th Ser. XV, pp. 375-376, 1895) after independent investigation agree that Shaw's name *canadensis* was published in 1803, while no one ever claimed that Desmarest's name *cervina* appeared before 1804. In the winter of 1890, when preparing my report on the Mammals of Idaho, and unaware of Bolton's determination of the date, I looked into the matter with some thoroughness and adopted the name *canadensis* as of unquestionable priority (N. Am. Fauna, No. 5, p. 81, 1891).

**Ovis mexicanus** sp. nov.

*Type* from Lake Santa Maria, Chihuahua. No. 99,342 ♂ ad. U. S. National Museum, Biological Survey Collection. Collected Sept. 16, 1899 by E. W. Nelson and E. A. Goldman. Orig. No. 13,974.

*Characters*.—Size large; color dark, much darker than *nelsoni* but less dark than *canadensis*; horns large; massive, dark, not strongly out-curved; hoofs and molars larger than in *O. canadensis*; ears long and large, nearly double the size of those of *canadensis*, measuring from occiput, in dry skin, 110-116 mm.; tail long and slender, measuring about 130 mm. Color pattern similar to that of *canadensis*.

*Color*.—Body color above and below drab brown, darkest on throat, legs, and tail; no trace of dorsal stripe; muzzle decidedly paler than rest of face; rump patch broader and more squarely truncate anteriorly than in *canadensis*; dark color on hind leg covering much more of inner side of thigh than in *canadensis*; but much less of lower leg, the white spreading broadly over the posterior and inner aspects, and on the inner side ending abruptly just above the calcaneal joint; whitish of chin broader and less sharply defined.

*Cranial characters*.—Skull as a whole large and massive. Compared with *canadensis*, orbits less prominent; frontals flatter (less 'dished' in forehead); basioccipital narrow, its sides nearly parallel, its muscular facets small and median sulcus broad; occiput (viewed from behind) much narrower; depth of face (above molars) less; premaxillæ longer, more slender, and reaching much farther back; jugal relatively small and less expanded anteriorly; lachrymal long, reaching well out toward premaxilla; paroccipital narrower and more slender; *lips of posterior nares* (behind hamulars) *thin* and somewhat everted [in *canadensis* thickened and *much swollen*]; angle of mandible obsolete; coronoid process lower and less expanded. Molar teeth larger. Horn cores longer, with longer curve and less flaring base.

*Horns*.—Large and heavy, but longer and less massive than those of *canadensis*; upper (flat) side narrower; base less flaring; orbital corner shortly rounded off (not produced).

*Measurements*.—Type specimen, ♂ ad.: Total length 1530; tail vertebrae 130; hind foot 425; height at shoulder 900. An ad. ♀ from type locality: total length 1490; tail vertebrae 130; hind foot 405; height at shoulder 880.

In examining a number of skulls of the Bighorn in the collection of the U. S. National Museum it is found that those from the Plains region of the western Dakotas and eastern Montana differ in important characters from those from the Rocky Mountains in Montana and Alberta. These differences appear to be constant and necessitate the recognition of the Plains animal as a subspecies of *Ovis canadensis*. The chief differences are the great size of the molar teeth and the massive-



ness and depth of the lower jaw. No skins have been examined. The new form may be known as follows:

*Ovis canadensis auduboni* subsp. nov.

*Type* from 'Upper Missouri'. No.  $\frac{1133}{1131}$  ♂ yg.-ad. U. S. National Museum. Believed to have been collected in the Badlands of South Dakota in 1855 by Dr. F. V. Hayden, on the Warren Expedition.\*

*Characters*.—Size large; skull and horns broad and massive; molar teeth much larger than in any known American sheep, the upper tooth-row in adult males measuring 96 mm. or more, and the 3 upper molars 63-65 mm. Underjaw (in type specimen) massive, heavy posteriorly, deeply bellied (depth under last molar 52 mm.); angle broadly rounded. In *canadensis* the jaw is light throughout and the angle, while small, is marked. Horns narrower and as a rule longer than in *canadensis*.

The animal is named in honor of Audubon, who in 1843 obtained from the Badlands specimens which he supposed the same as the Rocky Mountain species.†

In the desert region of northwestern Chihuahua, not far from Lake Santa Maria where the new *Ovis mexicanus* was obtained, Mr. Nelson and Mr. Goldman secured a series of eleven Pronghorn Antelopes. Comparison of these specimens with specimens from the northern Plains develops differences which seem to necessitate the separation of the southern from the northern animal. It may be known as follows:

*Antilocapra americana mexicana* subsp. nov.

*Type* from Sierra en Media, Chihuahua, Mexico. No. 98,742 ♂ yg. ad. U. S. National Museum, Biological Survey Coll. Collected October 4, 1899, by E. W. Nelson and E. A. Goldman. Orig. No. 13,989.

*Characters*.—Similar to *A. americana* but paler (in fresh fall pelage drab brown with a tinge of ecru, becoming cinnamon when the tips of the hairs wear off); mane absent or reduced to a narrow line of dark

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\*The U. S. National Museum register contains entries of several Mountain Sheep collected by Dr. F. V. Hayden on Lieut. G. K. Warren's Expedition to the Upper Missouri in 1855. In Lieut. Warren's report on his 'Explorations in the Dakota Country in the year 1855' (published in 1856), Dr. Hayden states that the bighorn was abundant in the region known as the badlands, and the narrative shows that the particular badlands meant are those between the Cheyenne and White Rivers in South Dakota.

†Quadrupeds of North America, Vol. II, pp. 163-172. 1851.

hairs on the nape; a median dorsal dark streak usually present on neck, sometimes reaching posteriorly to shoulders; head markings more sharply defined; occiput distinctly white or whitish, clearly defined posteriorly, and divided by a median dark stripe.

*Cranial characters.*—Skull similar to that of *americana* but orbits less abruptly protruding antero-inferiorly; premaxillæ more slender, especially posteriorly; bullæ thinner; lips of posterior nares longer (facial part of skull set farther forward).

*Measurements.*—Total length 1420; tail vertebræ 145; hind foot 410; height at shoulders 830.

PROCEEDINGS  
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A NEW SQUIRREL FROM BORNEO.\*

BY GERRIT S. MILLER, JR.

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The United States National Museum contains two specimens of the Bornean squirrel commonly referred to *Sciurus tenuis*, one taken by Mr. A. Everett, the other by Mr. Charles Hose. Externally they closely agree with true *Sciurus tenuis*, an animal which was originally described from material collected at Singapore. The skulls, however, are readily distinguishable from those of the Singapore squirrel, and show that the Bornean form, though closely related, is worthy of recognition by name. It may be called:

***Sciurus parvus* sp. nov.**

*Type*.—Adult male (skin and skull) No. 84,500 United States National Museum. Collected at Nulu, Sarawak, Borneo (altitude 1000 feet) in October, 1894, by Charles Hose.

*Characters*.—Externally similar to *Sciurus tenuis* Horsfield, though underparts perhaps less tinged with buff; skull slightly larger than that of *S. tenuis*, the braincase disproportionally large and deep.

*Color*.—The color so closely resembles that of *Sciurus tenuis* that no detailed description is required. In the Bornean specimens the belly is less washed with buff than in the topotypes, but the difference may be seasonal, as the former were taken in summer and autumn, the latter in spring.

*Skull and teeth*.—Viewed from above the skull of *Sciurus parvus* differs from that of *S. tenuis* in its more inflated, globose braincase. The dif-

ference is particularly noticeable posteriorly. The greatest breadth of braincase in each of two Bornean specimens is 19 mm., while in three topotypes of *S. tenuis* it is only 17.6 mm. The interorbital breadth on the contrary is nearly the same in the two species, while there appears to be no difference whatever in the breadth of rostrum. Viewed from the side the peculiarities in the skull of the Bornean animal are even more apparent. The depth of braincase from middle of parietal to lower edge of audital bulla is fully 2 mm. greater than in *Sciurus tenuis* while the depth of rostrum is barely equal to that of the mainland animal. In *Sciurus parvus* the ratio of least rostral depth to the cranial depth just defined is about 41; in *S. tenuis* it is about 49. The ventral aspect of the skull shows no peculiarities.

*Teeth* as in *Sciurus tenuis*.

*Measurements*.—External measurements of type (a well made skin): total length, 285; head and body, 165; tail vertebrae, 125; pencil, 45; hind foot, 37.6 (35); ear from meatus, 13.8; ear from crown, 10.

Cranial measurements of type: greatest length, 39; basal length, 31.6; palatal length, 16.6; length of nasals, 11.4; greatest breadth of nasals, 5.4; interorbital breadth, 13.4; zygomatic breadth, 23.6; greatest breadth of braincase, 19.4; cranial depth from middle of interparietal to lower rim of audital bulla, 17; least depth of rostrum, 7; mandible, 21.6; maxillary toothrow (alveoli), 7; mandibular toothrow (alveoli), 7.2.

*Specimens examined*.—Two, the type and one from Spitang.

*Remarks*.—A series of Bornean specimens may show that *Sciurus parvus* differs from *S. tenuis* externally as well as in cranial characters. The Spitang skin is distinctly the more gray of the two, but as it was taken in July and the type specimen in October the difference is probably seasonal. In color it is approached by a specimen of *S. tenuis* taken at Singapore in May. Except in external appearance the Bornean animal in no way closely resembles the small *Sciurus procerus* of Bungan Island, North Natunas.

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PROCEEDINGS  
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A NEW DEER FROM COSTA RICA.\*

BY GERRIT S. MILLER, JR.

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In the original description of his *Cariacus clavatus*,† the *Odocoileus truei* of Merriam, from the Segovia River‡, eastern Honduras, Dr. F. W. True recorded seven Costa Rican deer in the National Museum collection, which though of unusually large size, he regarded as not separable from the Honduras animal. The differences between the deer of the two regions are so constant, however, that it now seems preferable to recognize the Costa Rican form as distinct. It may be known as:

*Odocoileus costaricensis* sp. nov.

*Type*.—Young adult male (skin and skull) No. ††††† United States National Museum.§ Collected in Talamanca, on the eastern side of Costa Rica, between the coast and the foot of the Cordilleras, by José C. Zeledón, during the latter part of 1872 or early in 1873.

*Characters*.—Considerably larger than *Odocoileus truei* Merriam, and general color lighter and more grizzled, particularly on sides of body. Skull and teeth uniformly larger and more robust than in the Honduras animal. Antlers heavier and more rugose.

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†Proc. U. S. Nat. Mus., XI, pp. 417-424. 1888.

‡Mr. Chas. H. Townsend who collected the original specimens informs me that they were taken in the open pine lands about 50 miles above the mouth of the river.

§Permanent dentition in place, but teeth practically unworn.

*Color*.—Dorsal surface a uniform, fine, but distinct grizzle of drab, black and buff, the individual hairs colored as follows: from base to slightly beyond middle drab, then after a rather abrupt transition, black to tip, the black area interrupted by a sharply defined band of light buff about 2 mm. in width. The buff is the predominating element of the grizzle except on crown, forehead, nape and middle of anterior portion of back, where black is in excess, without, however, forming any defined dark markings. Sides like back but the buff area on each hair is increased at the expense of the black. The resulting color is somewhat paler and coarser grizzle. Underparts mostly wood-brown, lighter on the neck, darker on the belly. Region between hind legs, and an ill-defined median line running forward to chest, dull white. The white reappears faintly on inner side of both front and hind legs, but is irregular and ill-defined, and scarcely extends downward to hock. Elsewhere the legs are wood-brown, faintly darker on outer side. Tail entirely white beneath, cinnamon above, dusky at tip. Ears grayish externally, whitish internally. Cheeks light wood-brown. Muzzle dusky. A faintly defined pallid area on throat between jaws. Hoofs black, edged with horn color.

A second specimen is in very bleached, abraded coat. General color light buff, but speckling of back and sides still evident notwithstanding the imperfect condition of the hairs. Front legs much paler than in the type, but color of hind legs not sensibly altered.

*Skull*.—Skull distinctly larger than that of *Odocoileus truei* but not otherwise tangibly different. In size and form it closely agrees with that of the externally quite dissimilar *Odocoileus thomasi* Merriam from Chiapas. The basal length in the type of the latter is 230 mm., in a second specimen 220. In *O. costaricensis* the basal length ranges from 235 to 250, and in *O. truei* from 200 to 220.\*

*Teeth*.—The maxillary teeth are broader than in *Odocoileus truei*, though the toothrow is not increased in length. The increase in width is especially noticeable in the middle permanent premolar. Mandibular molars practically identical with those of the smaller animal, but premolars, particularly the first, much larger.

*Antlers*.—The antlers though similar in general form to those of the other members of the group are more robust and more coarsely rugose than in any of the allied species. A rudimentary prong is occasionally developed on inner face near middle. Beyond this region the surface of the antler is smooth.

*Measurements*.—External measurements of type (from well made skin): total length, 1400; tail vertebrae, 120; hind foot, 375; greatest diameter of hoof, 50; ear from crown, 110.

Cranial measurements of type: greatest length, 250 (264);† basal

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\*The skull of *Odocoileus nebloni* Merriam, also from Chiapas, is probably of about the same size as that of *O. truei*. In the type (an immature male) the basal length of skull is 197.

†Measurements in parenthesis are those of the largest Costa Rican skull.

length, 237 (250); basilar length, 220 (235); median palatal length, 155 (165); palatal width between anterior molars, 38 (46); least interorbital width, 57 (64); greatest width between lower rims of orbits, 101 (112); zygomatic breadth, 94.6 (108); mastoid breadth, 74 (86); occipital depth, 58 (57); mandible, 190 (195); upper toothrow (alveoli), 68 (68);‡ lower toothrow (alveoli), 70 (82); length of the three lower premolars together (alveoli), 31 (33).

*Specimens examined*.—Two skins and four extra skulls, all from Costa Rica.

*Remarks*.—In addition to its larger size this species differs from *Odocoileus truci* in the distinctly speckled back and sides. In the smaller animal the light subterminal bands on the back are broader and less strongly contrasted with the dark tips, while on the sides this element of the marking is so extended as to cover practically all of the visible part of the hair. As a result the sides are uniformly colored, without trace of grizzle. This condition is repeated in *Odocoileus thomasi*, the only species equalling *O. costaricensis* in size.

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‡Type of *O. truci*: upper toothrow (alveoli), 66; lower toothrow (alveoli), 73; length of the three lower premolars together (alveoli), 28. In the type of *O. thomasi* the corresponding measurements are 70, 80 and 32.





PROCEEDINGS  
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A NEW DORMOUSE FROM ITALY.\*

BY GERRIT S. MILLER, JR.

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Among the mammals collected in Italy during the summer of 1900 by Mr. Dane Coolidge are five specimens of an *Eliomys* related to *E. quercinus* but differing from it in the color pattern of the tail and in the general coloration of the body. It is not closely allied to the Sicilian *Eliomys pallidus* Barrett-Hamilton, so far as can be determined from the description of the latter.

*Eliomys cincticauda* sp. nov.

*Type*.—Adult male (skin and skull) No. 103,030 United States National Museum. Collected at Sorrento, near Naples, Italy, May 31, 1900 by Dane Coolidge. Original number 1118.

*Character*.—Size and general appearance as in *Eliomys quercinus*, but dorsal surface light wood-brown, and tail completely encircled by the black subterminal area. Line of demarkation on sides sharply defined and as conspicuous as in *E. quercinus*. Skull and teeth not peculiar.

*Color*.—Entire upperparts wood-brown (slightly paler than Ridgway's pl. III, fig. 19) brightest on head and on middle of back, inconspicuously sprinkled with blackish hairs, and lightened across shoulders and on sides by a suffusion of pale ecru-drab. The individual hairs are mostly slate-gray (Ridgway pl. II, fig. 5) through a little more than basal half, then pale ecru-drab for a varying distance, followed by wood-brown at tip. Among the hairs of this kind are scattered longer ones that appear to be blackish throughout. The varying width of the ecru-drab and

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wood-brown areas cause the slight differences in color of the back and sides. Color of sides continued down outer side of hind leg to heel and outer side of front leg nearly to wrist. Underparts whitish cream-color. the line of demarkation everywhere sharply defined and the contrasts conspicuous. Black face markings exactly as in *Eliomys quercinus*. Tail sharply bicolor from base to a little beyond middle, creamy white below, wood-brown mixed with white above. Slightly beyond middle there is a rather sudden change both above and below to black. This color continues uninterrupted for a distance of about 20 mm. on lower side and on upper side to base of terminal, nearly clear white pencil. The entire white area at tip of tail is about 10 mm. in length above and 30 mm. below. While the black of the upper surface extends further back than that below, the reverse is true of that of the under side of the tail. This shows a distinct tendency to run forward along the median line and divide the white area into two lateral stripes. Feet dull white. Ears thinly sprinkled with minute whitish hairs.

*Skull and teeth.*—I can find no tangible characters to distinguish the skull and teeth from those of *Eliomys quercinus*.

*Measurements.*—External measurements of type: total length, 249; head and body, 136; tail vertebrae, 108; hind foot, 29 (28). A second specimen (♂) from the type locality: total length, 254; head and body, 147; tail vertebrae, 107; hind foot, 30 (29). The hind foot in each of two other topotypes measures 30 (29). One of these specimens is a female.

Cranial measurements of type: greatest length, 34; basal length, 29; basilar length, 26.4; greatest length of nasals, 12.4; greatest width of both nasals together, 4.4; median palatal length, 12.8; greatest breadth of palate between toothrows, 4; diastema, 8; zygomatic breadth, 19; least interorbital breadth, 4.6; breadth of braincase above roots of zygomatics, 14.8; mastoid breadth, 16.6; least depth of rostrum behind incisors, 6; distance from middle of parietal to lower edge of audital bulla, 13.2; mandible, 17; maxillary toothrow (alveoli), 5.4; mandibular toothrow (alveoli), 5.2. Another skull (male) is somewhat larger; greatest length, 36; basal length, 31; maxillary toothrow, 5.8.

*Specimens examined.*—Five, all from the type locality.

*Remarks.*—Aside from the different color pattern of the tail this animal differs from *Eliomys quercinus* in the strong wood-brown of the upper parts and the very distinct cream color of the ventral surface. In *E. quercinus* the underparts are clear white slightly tinged with blue, while the white of the tail is all pure. In the Italian animal the only marking that approaches pure white is the terminal area of the tail. From *Eliomys pallidus* this species differs in the brown (not "light powdery-looking gray") underparts, distinct black head markings, sharp line of demarkation along sides, and as the description contains no reference to the color pattern of tail, probably in this character as well.

PROCEEDINGS  
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FIVE NEW SHREWS FROM EUROPE.\*

BY GERRIT S. MILLER, JR.

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Among the extensive series of European shrews collected for the United States National Museum during the past three years there are five forms that have not been hitherto described. Two of these were taken in Sicily by Mr. Dane Coolidge, two in the foothills of the Pyrenees by Mr. Robert T. Young, and one in Switzerland by Mr. J. Alden Loring.

*Crocidura sicula* sp. nov.

*Type*.—Adult male (skin and skull) No. 103,301 United States National Museum. Collected at Palermo, Sicily, June 20, 1900, by Dane Coolidge. Original No. 1332.

*Characters*.—Smaller than *Crocidura russula* from central Europe (total length about 105 instead of 120; hind foot, 13 instead of 15); color, both above and below, lighter than in the continental animal.

*Color*.—Dorsal surface drab (a trifle paler than Ridgway's pl. III, fig. 18) faintly clouded with broccoli-brown, many of the hairs showing silvery tips in certain lights. Underparts pale smoke-gray approaching white. Along sides the transition from drab to gray is much more abrupt than in *C. russula* in corresponding coat. Tail dull drab, faintly paler below. Feet an indefinite gray intermediate between color of tail and belly. The fur is everywhere gray (Ridgeway pl. II, fig. 7) at base.

*Skull and teeth*.—The skull and teeth are uniformly and noticeably

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smaller than in *Crocidura russula*, but otherwise they show no peculiarities.

*Measurements*.—External measurements of type: total length, 100; head and body, 68; tail, 32; hind foot, 13 (12). Measurements of an adult female from the type locality: total length, 110; head and body, 75; tail, 35; hind foot, 13 (12).

Cranial measurements of type: greatest length (exclusive of incisors), 17.6 (19);\* greatest postorbital breadth, 8.8 (9.6); greatest antorbital breadth, 6.2 (6.8); mandible, 9 (10); entire maxillary toothrow, 8.4 (9); entire mandibular toothrow, 8 (8.6).

*Specimens examined*.—Two, both from the type locality.

*Remarks*.—*Crocidura sicula* differs from *C. russula* in the characters that would be expected from the known peculiarities of other members of the Sicilian fauna.

#### *Crocidura caudata* sp. nov.

*Type*.—Young adult female (in alcohol) No. 103,302 United States National Museum. Collected at Palermo Sicily, June 21, 1900, by Dane Coolidge. Original number, 1365.

*Characters*.—Somewhat larger than *Crocidura sicula* (total length about 115, hind foot about 15) and differing from this as well as from other European species in the size and great length of the tail, which when laid forward over back reaches to middle of ear.

*Tail*.—The tail forms about 42 per cent of the total length and at middle is 3 mm. in diameter. Near base it is distinctly four-sided, but beyond middle becomes sub-cylindric. The tip is flattened laterally for about 13 mm. evidently as the result of an accident. Scales arranged in indistinct rings, of which there are about 7 to the millimeter at middle. The rings are partly obscured by fine short hairs; and the longer bristles with which the tail is sprinkled are more abundant than in *Crocidura russula* and *C. sicula*.

*Color*.—Color after six months immersion in alcohol essentially as in *Crocidura sicula* but fur both above and below with a dull slaty cast, and transition from drab of back to gray of underparts less abrupt.

*Skull and teeth*.—The skull is so injured that the details of its form cannot be seen, but apparently the rostrum is relatively shorter and the interorbital region broader than in either *Crocidura russula* or *C. sicula*. Teeth as in the related species except that the first upper unicuspid is larger and the second and third are so crowded that the third is tightly wedged into the concavity on the inner side of the large premolar. It is thus partly hidden by the small anterior cusp of the large tooth, while in the related species it is so far removed from the latter that a distinct break in the toothrow is usually seen when skull is viewed from the outer side. How far these characters may be constant cannot be

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\*Measurements in parenthesis are those of an adult male *Crocidura russula* from Waremmé, Belgium.

determined from a single specimen; but I find no close approach to them among a considerable number of specimens of *Crocidura rursula* from continental Europe.

*Measurements*.—External measurements of type: total length, 115; head and body, 63; tail, 52; hind foot, 15 (14).

*Specimen examined*.—One, the type.

*Remarks*.—Although represented by a single individual only this species appears to be remarkably well characterized.

***Sorex araneus alticola* subsp. nov.**

*Type*.—Adult female (skin and skull) No. 85,930 United States National Museum. Collected near Meiringen, Switzerland (altitude 2100 m.), October 17, 1898, by J. Alden Loring. Original number 5781.

*Characters*.—Larger than true *Sorex araneus* and with relatively longer tail. Teeth more heavily pigmented than in the typical form.

*Color*.—Summer pelage (type specimen): fur short harsh and dull. Entire dorsal surface rather pale sepia. Sides broccoli-brown faintly tinged with drab. Underparts light gray strongly washed with Isabella color. Though there is no sharp line of demarkation between the color of back and sides, and only slightly more between that of latter and underparts, the transition is sufficiently abrupt to render the animal as a whole distinctly tricolored. Tail sharply bicolor, seal-brown above and at tip, broccoli-brown below. Feet glistening broccoli-brown. Winter pelage: fur long soft and lustrous. Elements of color essentially the same as in summer, but sepia of dorsal surface darkened until it approaches black, and gray of under parts scarcely tinged with Isabella color. Sides as in summer. The tricolored pattern is thus more noticeable than in the other pelage, particularly in the sharp contrast between back and sides.

*Skull and teeth*.—Though the skull and teeth agree with those of typical *Sorex araneus* in size and form, the teeth are readily distinguishable by their more extensive and darker pigmentation. The differences are most readily seen upon comparison of the small cusps on the lingual side of the upper molars and large premolar, that is, the protocone of the posterior molar and the hypocone of each of the other teeth. Seventy-five topotypes of *Sorex araneus araneus* and twenty-two specimens of *S. araneus alticola* from the neighborhood of the type locality give the following results:

	<i>S. araneus. S. alticola.</i>	
Large premolar with pigment on hypocone	0%	45.4%
First molar with pigment on hypocone	22.6%	90.9%
Second molar with pigment on hypocone	21.2%	90.0%
Third molar with pigment on hypocone	45.3%	100%
None of the small cusps pigmented	54.6%	0%
All of the small cusps pigmented	0%	45.4%

*Measurements.*—External measurements of type specimen: total length, 131; head and body, 76; tail vertebrae, 55; hind foot, 16 (14). Average and extremes of ten specimens from the type locality: total length, 123 (118-131); tail vertebrae, 52.5 (47-57); hind foot, 14.8 (14-16); hind foot without claws, 13.3 (13-14).

*Specimens examined.*—Seventy-five, from the following localities in Switzerland: Andermatt, 48; Brünig, 9; Meiringen, 18.

*Remarks.*—On comparing the series of Swiss shrews with a somewhat greater number of true *Sorex araneus* from Upsala, Sweden, taken by the same collector, the differences between the two races are so apparent as to call for no special comparisons beyond those already given.

Twenty shrews from eastern Norway collected by Miss Thora Stejneger, mostly in the vicinity of Bergen, represent a large animal quite distinct from the *Sorex araneus araneus* of southeastern Sweden, and much resembling *S. araneus alticola*. Ten specimens give the following averages: total length, 127 (116)\*; tail vertebrae, 49 (39); hind foot, 16.2 (14); hind foot without claws, — (12.7). It will be seen that the Norwegian shrew exceeds both true *araneus* and *alticola* in length of hind foot, but that the tail, while longer than in the Swedish animal, is not quite equal to that of the Swiss form. Unfortunately the Norwegian specimens are all in the summer coat, and all are so old that the teeth are too much worn to show the pigmentation. The status of the animal therefore cannot be satisfactorily determined.

***Sorex araneus euronotus* subsp. nov.**

*Type.*—Adult male (skin and skull) No. 101,321 United States National Museum. Collected at Montréjeau, Hautes Pyrenees, France (in foothills of Pyrenees), July 8, 1899, by Robert T. Young. Original number, 642.

*Characters.*—Size slightly less than that of true *Sorex araneus*; color (in summer pelage), more brown, particularly on underparts.

*Color.*—The colors are essentially as in the summer pelage of *Sorex araneus araneus* and *S. araneus alticola* except that the browns are darker and the belly is heavily washed with wood-brown. The tricolored pattern though visible is less distinct than in the other races.

*Skull and teeth.*—Skull as in *Sorex araneus araneus*, but slightly though constantly smaller, and with less inflated braincase. Teeth as in the typical form but smaller and somewhat more heavily pigmented.

*Measurements.*—External measurements of type: total length, 122; head and body, 78; tail vertebrae, 44; hind foot, 13.5 (12.5). Average and extremes of nine specimens from the type locality: total length, 114 (107-117); tail vertebrae, 42 (37-44); hind foot, 13.8 (13.5-15); hind foot without claws, 12.8 (12.5-14).

*Specimens examined.*—Nine, all from the type locality.

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\*Measurements in parenthesis are those of a corresponding number of *Sorex araneus* from Upsala, taken at random from the large number at hand.

**Neomys fodiens minor** subsp. nov.

**Type.**—Adult male (skin and skull) No. 101,311 United States National Museum. Collected at Montréjeau, Hautes Pyrenees, France (in foothills of Pyrenees) July 8, 1899, by Robert T. Young. Original number, 641.

**Characters.**—Smaller than *Crossopus fodiens* from Sweden, Germany, Switzerland, and Belgium, (tail 50-60 instead of 65-75, hind foot with claws, 17-19 instead of 19-22), but incisor teeth noticeably larger. Color not distinctive.

**Skull and teeth.**—While the skull is of about the same size as in true *Crossopus fodiens* the braincase is somewhat narrower, and the rostrum consequently appears more massive. Teeth similar to those of typical *C. fodiens* in form, but anterior incisors and first and second unicuspid distinctly larger.

**Measurements.**—External measurements of type: total length, 136; head and body, 82; tail vertebræ, 50; hind foot, 17 (16). Two other adult males from the type locality measure respectively: total length, 137 and 151; head and body, 82 and 85; tail vertebræ, 53 and 60; hind foot, 18.5 (17.5) and 19 (18).

**Specimens examined.**—Three, all from the type locality.





PROCEEDINGS  
OF THE  
BIOLOGICAL SOCIETY OF WASHINGTON

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SIXTH LIST OF ADDITIONS TO THE FLORA OF  
WASHINGTON, D. C. AND VICINITY.

BY EDWARD S. STEELE.

WITH DESCRIPTIONS OF NEW SPECIES AND VARIETIES BY  
EDWARD L. GREENE, ALVAH A. EATON, AND  
THE AUTHOR.

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The following list is based upon a course of collecting prosecuted outside of my routine work for five years beginning with 1896. The general purpose has been merely to record names of new and less familiar plants, with stations; but advantage has been taken of the opportunity to publish a few descriptions of new local material and to record some observations.

Professor Greene has kindly furnished for publication here a name and character for a new violet which I was so fortunate as to discover. Mr. Alvah A. Eaton describes two new forms of *Isoetes*, which are not, however, my own discoveries. I propose a segregate from the *Lycopus virginicus* of authors, a well-marked species long since noticed, but apparently never properly named. In an extended note on *Vernonia glauca* I hope to have set that species in a somewhat clearer light. Other notes are scattered through the list.

I am indebted to several gentlemen for the revision of my determinations, particularly to Mr. L. H. Dewey, who studied all my earlier collections of grasses. The dichotomous Pani-

cums I have of late left wholly to the skill and kindness of Mr. E. D. Merrill, who is working with Professor Scribner in that trying field. Professor C. F. Wheeler has been referee for about all of the Carices that presented difficulties, and I am also the beneficiary of Mr. Geo. B. Sudworth, Mr. Frederick V. Coville, Mr. J. N. Rose, Mr. Charles L. Pollard, and others.

The arrangement of the list follows the sequence of Engler and Prantl, but the numbers prefixed are those of Professor Ward's Guide to the Flora of Washington and Vicinity (Bull. U. S. Nat. Mus. No. 22, 1881) and the subsequently published additions. In order to preserve the original numeration, and at the same time place the additions in their proper connections, the use of appended letters has been resorted to.

The prefixed asterisk denotes a species not hitherto recorded in print as belonging to our flora. In the case of a number of these species my collection has probably been anticipated by that of other collectors whose results have not been published, but it is not practicable wholly to avoid this injustice. On the other hand, some first collected by me have in the same manner been entered in an earlier list.

**\*1217a. *Pteris aquilina pseudocaudata*** Clute. (*P. aquilina caudata* of American authors, not of Linnaeus).

Kenilworth, abundant near the railroad, September 20, 1900. Also near Hyattsville.

**1233a. *Dryopteris spinulosa*** (Retz.) Kuntze.

In a ditch near Captain Jones' place beyond Chevy Chase Lake.

**1234. *Dryopteris spinulosa intermedia*** (Muhl.) Und.

Not seen near the city. Found at Suitland, near Kensington, and near Great Falls on the Virginia side.

**1237a. *Onoclea struthiopteris*** (L.) Hoffm.

A few sterile fronds, Plummer's Island, May 31, 1897.

**1240. *Lygodium palmatum*** (Bernh.) Sw.

In a drained swamp, eastern part of Suitland, Sept. 8, 1899.

**\*1213a. *Equisetum robustum*** A. Br.

On both sides of Beaver Dam Branch, near the road. Rarely found in fruit.

**\*1253c. *Isoetes saccharata*** Engelm.

In tide mud among coarse gravel along the bay at the mouth of Four Mile Run, August 5, 1898. The range as given in Britton and Brown's Flora is "Wicomico and Nanticoke rivers, eastern Maryland". The following varieties, though not of my own collecting, may be appropriately published in this place.

\*1253d. *Isoetes saccharata* Palmeri A. A. Eaton, var. nov.

Aspect of *riparia*. Leaves much stouter than in the type, 1 to 1½ dm. long, recurved; macrospores 500 to 550M, with markings taller and more confluent, strongly suggesting *riparia*.

This variety might easily pass for *riparia*, which has, indeed, happened several times; but the very narrow, almost obsolescent velum, the less tuberculate microspores, the smaller, more closely sculptured macrospores, and the dirty brownish color when dry, sufficiently distinguish it. The spores appear intermediate between *riparia* and the varieties of *Echinospora* in sculpture, some of the markings being irregular walls, others broad, often forked spinules as in *Braunii*.

First collected by Mr. T. C. Palmer, of Media, Pa., at Lloyd's Creek, Sassafras River, Maryland, August 12, 1895, and by him ably characterized\*. Specimens collected by Mr. Frederick V. Coville at the foot of the Washington estate, Mount Vernon, Va., do not fully agree, but apparently connect the variety with the typical form of the species.

Types in the herbarium of A. A. Eaton, the National Herbarium, and those of the Missouri Botanical Garden, the University of Minnesota, and the Linnaean Fern Chapter.—A. A. Eaton.

1253b. *Isoetes saccharata reticulata* A. A. Eaton, var. nov.

Smaller; leaves 10 to 20, slender, erect, vivid green, 1.5 to 2 dm. long, with abundant stomata; macrospores 400 to 432M, marked with low, parallel, anastomosing walls above and more or less regularly reticulate below.

The aspect of this plant also suggests *riparia* rather than *saccharata*. The spores sometimes resemble those of small *Tuckermanni* or even *Engelmanni*, but the walls are much lower, often mere threads. Occasionally a spore is found which bears parallel walls below as well as above.

Hunting Creek by the wagon bridge near its mouth, one mile below Alexandria, Va., July 22, 1888, Geo. Vasey and Frederick V. Coville; same station, September 22, 1900, Wm. R. Maxon, No. 365. Also tide beach, Anacostia river, Washington, D. C., September 1, 1900, E. S. Steele. Perhaps referred to by Palmer (l. c. p. 222). Type specimens are deposited in the herbaria mentioned in the description of the preceding variety.†—A. A. Eaton.

886. *Potamogeton Nuttallii* Cham. & Schlecht. (*P. Claytonii* of Ward's Catalogue.)

Common in the tributaries of the Eastern Branch.

\*885a. *Potamogeton amplifolius* Tuckerm.

Mouth of Four Mile Run and Hunting Creek, also in Anacostia river, but flowers and fruit not seen.

\*893a. *Echinodorus radicans* (Nutt.) Engelm.

Along a depression in the flats below Chain Bridge, perhaps a dozen

\*Bot. Gaz. 4: 221. 1890.

†The Vasey and Coville specimen cited above is that determined by Theo. Holm in the third list of additions as *I. riparia* Engelm. It is hence given the same number, and the asterisk is omitted.—E. S. S.

specimens, some well developed, August 1, 1900. In Britton and Brown's Flora the northern limit of this species on the Atlantic coast is given as North Carolina.

**\*893. *Lophotocarpus calycinus* (Engelm.) J. G. Smith.**

Eastern Branch below Navy Yard, growing in tide mud; also below Alexandria, September 4, 1899. Apparently scarce within our limits.

**\*894a. *Sagittaria Engelmanniana* J. G. Smith.**

First collected, in sterile condition only, in a swampy pasture near Ardwick, Md., September 6, 1899. Two or three fruiting specimens were found on the water's edge at Great Falls, October 3, 1899. This extends the known range of the species, and proves that it is sometimes dioecious. Determination confirmed by Mr. J. G. Smith.

**\*894b. *Sagittaria pubescens* Muhl.**

Very common in swamps, springy places, and ditches, but in my experience not found in or close to open water. It reaches the edge of the river marsh, but I have not observed it far inside.

I have been somewhat inclined to regard this plant as specifically distinct from *S. latifolia*, and as Mr. J. G. Smith is willing to be quoted in support of this view, I feel warranted in restoring it. The leaves greatly resemble in form those of typical *latifolia*. They vary in length from 4 inches to a foot, including the lobes, and are rounded or obtusely angled at the apex, differing somewhat in the length of the lobes, which, however, are usually moderately shorter than the blade; but they do not run into the well known eccentricities of the *latifolia* forms. A very characteristic feature is found in the involucre bracts, which are at least as broad as long, of a yellowish white and translucent hue, and densely hirsute-pubescent.

**\*894c. *Sagittaria longirostra* (Michx.) J. G. Smith.**

In moderate quantity in the marsh around the mouth of Oxen Run, opposite Alexandria, August 18, 1900,

**\*1203a. *Andropogon Elliottii* Chapm.**

Brightwood Park Swamp, September 20, 1896; Connecticut Avenue Bridge, October 7, 1896.

**\*1204a. *Andropogon halepensis* (L.) Brot.**

Rather common around dumping grounds. The cultivated sorghum and broom corn also appear occasionally in these situations.

**\*1191a. *Panicum Walteri* Pursh.**

Shore west of bathing beach, September 2, 1897.

**1178. *Panicum agrostoides* Trin. (*P. agrostoidiforme* of Britton and Brown.)**

River swamp, Brick Haven, October 10, 1896; also South Washington and below Alexandria.

**\*1178a. *Panicum longifolium* Torr.**

Kenilworth Swamp, August 28, 1897. Also swamp above Hyattsville.

**1187a. *Panicum sphaerocarpon* Ell.**

Flats near mouth of Oxen Run, July 1, 1899. Also Arlington.

- 188f. **Panicum polyanthes** Schultes. (*P. microcarpon* of Ward's Catalogue.)

District Line, August 4, 1896. Also Four Mile Run.

- 187. **Panicum Ravenelii** Scribn. & Merrill. (*P. pauciflorum* of Ward's Catalogue.)

Slope above Canal road, May 24, 1898, June 12, 1900.

- 1188e. **Panicum Scribnerianum** Nash.

Kenilworth, June 9, 1899.

- 1188. **Panicum dichotomum** L.

Of the *dichotomum* group I have, as determined by Mr. E. D. Merrill, besides *dichotomum* itself: *Atlanticum* Nash, *barbulatum* Michx., *Clutei* Nash, *Columbianum* Scribner, *commutatum* of authors, not of Schultes, *implicatum* Scribner (doubtful species), *lanuginosum* Ell., *luxiflorum* Lam., *lucidum* Ashe, *unciphyllum* Trin. The *lucidum* takes the place of *sphagnicolum* Nash as to this locality.

- 1192a. **Panicum miliaceum** L.

Waste ground, several places.

- 1180c. **Panicum capillare Gattingeri** Nash.

Plummer's Island, August 24, 1897. Also Great Falls and Bethesda.

- 1180b. **Panicum flexile** (Gattinger) Scribn.

Near Glen Echo, September 11, 1896; Linnaean Hill Road, September 27, 1899.

- 1180d. **Panicum minimum** Scribn. & Merrill. (*P. minus* of Britt. & Brown.)

South Arlington near Four Mile Run, August 27, 1899; also Bennings.

- 1193a. **Chaetochloa imberbis perennis** (Hall) Scribn. & Merrill.

Kenilworth, first half of August, 1898, and in many places since; most abundant near Beaver Dam Branch; also at Jackson City, and near Brightwood swamp. It appears to be most at home in swamps and moist ground, but I have seen it in dry soil at West Eckington and even on a dry southern slope near the Massachusetts Avenue Bridge.

- 1193. **Chaetochloa verticillata** (L.) Scribn.

Occurs occasionally in waste ground, but appears never to multiply much.

- 1172a. **Phalaris arundinacea** L.

Wet field, Jackson City, west of road, June 14, 1896 and June 6, 1899.

- 1117. **Aristida gracilis** Ell.

Arlington, near the river, and also on the Rockville road. The form known as variety *depauperata* Gray was found at Bennings, September 18, 1897.

- 1108. **Muhlenbergia Mexicana** Trin.

A form with long culms and slender panicles, corresponding presumably to the variety *filiformis*, was collected along the Glen Echo railroad. The type has been found in several places.

**1110. Muhlenbergia tenuiflora** (Willd.) B. S. P.

Arlington near Four Mile Run, August 27, 1899; Hyattsville, September 26, 1900, the latter specimens over 4½ feet long.

**\*1111a. Muhlenbergia palustris** Scribn.

The peculiarities of this grass were noticed in my collection of 1896, but it was distributed as *M. diffusa* for lack of a better determination. The next year attention was again called to the differential characters, which resulted in its description as a new species. Outwardly it is distinguished by its habit, which is even more slender than that of *M. diffusa*, and by its pink purple instead of dark purple hue. More closely examined, the development of the lower glume will be noticed as the distinctive feature. The type locality is Brightwood Park swamp, which forms the head of Piney Branch. It still exists here, but is suffering much from the spirit of improvement. The only other station known is the wet meadow south of Beaver Dam Branch, west of the Anacostia road.

**1101a. Sporobolus vaginaeflorus** (Torr.) Wood.

This species is now understood by the agrostologists of the Department of Agriculture as including *S. neglectus* Nash. A tuft with culms 2½ feet long was found on the Rockville road.

**\*1102a. Agrostis intermedia** Scribn.

Arlington, August 11, 1896; Chautauqua, August 17, 1896; also on the river near Cabin John, and on the wooded flats at Hyattsville.

**1114a. Calamagrostis Canadensis** (Michx.) Beauv.

Bladensburg, in swamp west of the railroad, found overripe in 1898, and in good condition June 17, 1899. Also seen in a swamp north of Beaver Dam Branch, west of Anacostia road.

**1169a. Arrhenatherum elatius** (L.) Beauv.

Now abundant near Kalorama, beyond Eckington, etc. I would call attention to the fact that our plant has not only the long awn on the lower flowering scale, but also an awn in a slit at the summit of the upper flowering scale. The cleft sometimes descends one-third the length of the scale, but is generally more shallow. The awn, which is upwardly barbellate, generally overtops the scale, but is sometimes about equal to it or even shorter.

**\*1123a. Spartina cynosuroides** (L.) Willd.

One small patch at Jackson City, east of the railroad. Seen in larger quantity on the river flats at Harper's Ferry.

**\*1123a. Leptochloa fascicularis** (Lam.) A. Gray.

Sewer, lower part of Duke street, Alexandria, September 4, 1899.

**1140. Eragrostis Eragrostis** (L.) Karst.

Parking southwest of Treasury Building, September 28, 1899; also in 1900.

**\*1143a. Eragrostis pilosa** (L.) Beauv.

Jackson City, August 3, 1896; also near Eastern Branch and Upper Paint Branch.

\*1137a. *Poa flava* L.

Near railroad north of North Brookland, July 22, 1896; not since seen.

1129. *Panicularia Canadensis* (Michx.) Kuntze. (*Glyceria*, of Ward's Catalogue.)

Terra Cotta Swamp, collected in overripe condition in 1896 or 1897; in good condition June 23, 1899. Seen also in a swamp south of Four Mile Run.

1128a. *Panicularia pallida* (Torr.) Kuntze.

Bladensburg, a short distance beyond the spring, June 17, 1899.

1130. *Panicularia fluitans* (L.) Kuntze.

Feeder Dam, May 28, 1897. Seen also at Bladensburg, not far from the spring.

\*1151c. *Bromus purgans incanus* Shear.

Plummer's Island, August 24, 1897; also Four Mile Run and near canal below Cabin John. This grass blooms two months later than *B. ciliatus*. Only a few of the upper leaves remain green at flowering time, commonly overtopping the surrounding vegetation.

\*1151a. *Bromus unioloides* (Willd.) H. B. K.

Dumping grounds, May 28, 1898 and June 12, 1899.

\*1151b. *Bromus inermis* Leyss.

Dumping grounds, June 14, 1899; June 8, 1901.

\*1151d. *Bromus maximus* Desf.

Dumping ground, June 5, 1901.

\*1156a. *Hordeum pusillum* Nutt.

South Washington, 1896; Canal road, May 24, 1898.

\*1156b. *Hordeum murinum* L.

Dumping grounds, May 28, 1898.

989. *Cyperus microdontus* Torr.

Bladensburg, September 7, 1896. Anacostia road above Kenilworth, October 1, 1899, September 20, 1900. Seen also on the railroad a mile above Anacostia. Grows always in wet sand, and sometimes fruits at the height of an inch or two. This is doubtless the *C. Nuttallii* of Ward's Flora, as that species can scarcely occur here.

990a. *Cyperus inflexus* Muhl.

Margin of water, Jackson City, August 1, 1899; Chain Bridge, Virginia side, August 17, 1900. Has the fragrance when dried of slippery elm.

\*991a. *Cyperus fuscus viridescens* Hoffm.

Sewer at the foot of Duke street, Alexandria, September 4, 1899.

\*991b. *Cyperus rotundus* L.

A small patch on the waste ground west of the old fish pond, October 13, 1899.

993. *Cyperus strigosus* L.

Besides the type the varieties *compositus* and *robustior* seem to be distinguishable here, the former, however, not very common.

**\*997a. *Cyperus cylindricus* (Ell.) Britton.**

Near Kenilworth Swamp, September 18, 1897; Bennings, on the flats, July 15, 1899.

**1003a. *Eleocharis olivacea* Torr.**

One mile north of Berwyn, May 6, 1900.

**\*1006a. *Eleocharis tuberculosa* (Michx.) Roem. & Schult.**

Brightwood Swamp, July 24, 1897; Howard Hill Reservoir, very abundant, July 2, 1898.

**\*1003b. *Eleocharis capitata* (L.) R. Br.**

Howard Hill Reservoir, August 26, 1896; July 22, 1898.

**1002. *Eleocharis obtusa* Schultes.**

A clump of this species (following Mr. Fernald's revision) with culms over a foot-and-a-half tall was found in water at Four Mile Run.

**\*1002b. *Eleocharis obtusa jejuna* Fernald.**

Near Kenilworth.

**1002a. *Eleocharis Engelmanni* Steud.**

Damp path near Silver Hill, August 18, 1897; flats near Pennsylvania Avenue Bridge, June 29, 1897; also in the Howard Hill Reservoir.

**\*1003a. *Eleocharis palustris* R. Br. (Not of Ward's catalogue.)**

Swampy margin of river, opposite Alexandria, July 1, 1899. Not seen elsewhere.

**1003. *Eleocharis glaucescens* (Willd.) Schult.**

River swamp, Aqueduct Bridge, etc. Common. This is doubtless the *E. palustris* of Ward's catalogue.

**1019. *Stenophyllus capillaris* (L.) Britton.**

Specimens from low ground at Bennings had innumerable culms, many of them fifteen inches long.

**1010. *Scirpus debilis* Pursh.**

Bladensburg, near Terra Cotta; Chautauqua, across the canal; South Arlington.

**1012. *Scirpus sylvaticus* L.**

Lakeland at outlet of Lake, July 11, 1900.

**1000a. *Hemicarpha micrantha* (Vahl) Britton.**

Chain Bridge, Virginia side, August 19, 1900, a few specimens. Not seen elsewhere.

**1021b. *Rhynchospora corniculata macrostachya* (Lam.) A. Gray.**

Eastern Branch swamp, on both sides.

**1020. *Rhynchospora alba* (L.) Vahl.**

Brightwood swamp, in small quantity; Paint Branch swamps, abundant.

**1020a. *Rhynchospora gracilentia* A. Gray.**

Swamp one mile north of Berwyn, July 28, 1900.

**1020b. *Rhynchospora cymosa* Ell.**

Kenilworth swamp, June 20, 1898, a small amount. Swamp west of Anacostia road north of Beaver Dam Branch, August 5, 1898; Lakeland.



near creek, July 8, 1900.

**1022. *Scleria triglomerata* Michx.**

Terra Cotta swamp, June 20, 1896. Seen since in Kenilworth swamp, on Fairfax road south of Four Mile Run, and at Lakeland.

**\*1024b. *Scleria reticularis pubescens* Britton.**

Paint Branch swamps and north of Kenilworth. Other material from the Brightwood swamp (August 16 and September 22, 1897) with thicker culms and broader leaves may be *S. Torreyana* Walp. Thus far I find it very difficult to separate these species.

**1024. *Scleria pauciflora* Muhl.**

Addison Heights, Chevy Chase, Glen Echo Heights, Anacostia road north of Kenilworth, Takoma Park, and Lakeland.

**1090. *Carex lupulina* Muhl.**

I have a form from the woods bordering the river marsh at Bennings determined by Professor Wheeler as "the variety near var. *pedunculata* Dewey". The peduncle of the sterile head is over 3 inches long.

**1094. *Carex bullata* Schk.**

Formerly in the Brightwood Park swamp: common in the swamps around Hyattsville.

**\*1088a. *Carex lurida exundans* Bailey.**

Very common. A form from the Potomac flats has some of the staminate heads fertile at the summit.

**1087. *Carex hystrix* Muhl.**

Canal at District line, May 28, 1897. Not common.

**1085. *Carex comosa* Boott.**

I failed to distinguish this from *C. pseudo-cyperus* until last season, but specimens from the Potomac flats seem decisive.

**1092a. *Carex typhinoides* Schwein.**

Lakeland, between the electric and steam railroad tracks, August 4, 1900.

**1084. *Carex riparia* Curtis.**

Seen by me only in the river marsh east of the Alexander Island race course.

**1051. *Carex Shortiana* Dewey.**

A few specimens in the Feeder Dam region, 1896. Abundant on the Potomac flats west of the Fish ponds, 1900.

**\*1051a. *Carex lanuginosa* Michx.**

Feeder Dam, May 21, 1898; river swamp, Alexander's Island, May 12, 1900.

**\*1048a. *Carex stricta angustata* (Boott) Bailey.**

Margin of bay, foot of seventeenth street, May 18, 1898; also north of Berwyn. This is not to be confounded with the *C. angustata* of Ward's catalogue, which is doubtless the typical *C. stricta*.

**\*1051b. *Carex fusca* All.**

Bog one mile north of Berwyn, May 6 and July 28, 1900.

**\*1061a. *Carex costellata* Britton.**

Ravine, District line, May 15, 1899; Cleveland Park region and Massachusetts avenue extended.

**1062. *Carex triceps* Michx.**

Besides the type, which is common, I have a form with the awns of the scales much longer than the perigynia, probably *C. hirsuta cuspidata* Dewey; the difference is very considerable. Eastern Branch region, June, 1896; District line, May 28, 1897.

**\*1062a. *Carex Caroliniana* Schwein.**

Feeder Dam, May 28, 1897; Conduit road near Croyley, May 30, 1899.

**1039. *Carex gracillima* Schwein.**

Glencarlyn, in overripe condition, June 6, 1898; Rock Creek above Military road, May 9, 1899; also on Cabin John Run.

**1058a. *Carex amphibola* Steud.**

More common in my experience than *C. grisea* Wahl.

**1056. *Carex pallescens* L.**

Woods beyond St. Elizabeth's; scarce.

**1067. *Carex laxiflora* Lam.**

In my judgment the forms still covered by this name include from two to five good species. It is quite impossible to regard *blanda* and *patulifolia* as varieties of the same species. The soft deep green or yellowish-green foliage of the former is wholly distinct from the firm glaucous or grayish-green blades of the latter, the basal portion of which survives the winter as in *C. platyphylla*, a habit shown in a far less degree by *blanda*. *C. patulifolia* further differs in its more numerous and densely tufted culms, its linear spikes, and its habitat, keeping as it does to the upland while *blanda* descends to moist flats. If this separation were made, the variety *dicaricata* would go with *patulifolia*, provided it is not itself distinct. It differs from the latter in its larger and more stipitate fruit, its narrower leaves, the smaller number of culms, and the spreading habit, the culms standing at angles of about 45 degrees, while those of *patulifolia* are erect. The range of *dicaricata* requires further observation. It is fond of wooded hillsides, the sides of ravines, etc. I have collected or observed it near Eastern Branch, east of Soldiers' Home, in Rock Creek Park, in the Cleveland Park region, and beyond Glen Sligo. I have the typical *laxiflora*, so determined by Professor Wheeler, (although the fertile spikes are dense and not at all like the figure in Britton and Brown) from near Chevy Chase and from the District line toward Cabin John.

**1064. *Carex Careyana* Torr.**

Scarce, but found on High Island and in the woods at Seven Locks.

**1078. *Carex Pennsylvanica* Lam.**

Specimens from the south slope of the ridge at Four Mile Run were said by Professor Wheeler to be the first true *Pennsylvanica* he had seen from Washington.

**1077. *Carex nigromarginata* Schwein.**

Ravine, Linnaean Hill road.

**1030a. *Carex conjuncta* Boott.**

Potomac flats, spring of 1900 and 1901.

**\*1030c. *Carex gravida* Bailey.**

Monument ground in grass, May 23, 1898; also May, 1901, doubtless introduced. Professor Wheeler observes: "While your plant is not quite so robust as this species from Illinois and Iowa, I cannot put it anywhere else."

**\*1030d. *Carex xanthocarpa* Bicknell.**

Near Fourteenth street extended, May 28, 1900; South Arlington, May 30, 1900; beyond Eckington, June 10, 1900. Seldom very yellow in color. Grows both in wet and in comparatively dry ground, but more vigorously in the former. Its discovery here extends the known range. Professor Wheeler thinks our plant may be var. *annectens* Bicknell.

**\*1040b. *Carex setacea* Dewey.**

Slope above Canal road, June 15, 1900; so determined by Professor Wheeler. An extension of the known range.

**1037a. *Carex retroflexa* Muhl.**

Seven Locks, May 9, 1898, very young. Also, Little Falls on the Virginia side, in the woods above Georgetown, and on Linnaean Hill road.

**1034. *Carex Leavenworthii* Dewey. (*C. cephalophora angustifolia* of Ward's Flora).**

Specimens thus named by Professor Wheeler were collected near Kalorama Heights, May 26, 1899. He notes that the perigynia surely indicate this species, although the specimens are taller than usual and have not the bracts which are commonly, though not always present. The bracts are present in specimens retained by me. Since communicating with Professor Wheeler I have re-collected this plant (Mount Vernon, May 30, 1901; original locality, June 8), and have also collected the species, of normal size, in the grass near the Monument, where it is well established, having doubtless been introduced in grass seed. I can find no material difference between the forms except in the length of the culms, which in our possibly native plant is often 2, sometimes even 3, feet, but in the Monument ground plant does not exceed 16 inches. The narrow leaves and smaller heads set the species apart from our very abundant *cephalophora*.

**1035b. *Carex Atlantica* Bailey.**

Common in boggy places. This is probably the *C. stellulata* of Ward's Flora.

**\*1035c. *Carex Interior* Bailey.**

Wet ground, Glen Echo Heights, May 16, 1897; Feeder Dam, May 21, 1898; Mount Vernon, May 30, 1901.

**\*1035d. *Carex Interior capillacea* Bailey.**

Bog east of Anacostia road south of Beaver Dam Branch, June 3, 1900. An extension of the known range.

**\*1035c. *Carex canescens* L.**

Swamp, Hyattsville east of creek, May 17, 1898.

**1028. *Carex bromoides* Schk.**

Known to me only from the wet woods opposite the race course on Alexander's Island, which is probably exactly Dr. Vasey's station. May 12, 1900.

**\*1040c. *Carex tribuloides monilliformis* (Tuckerm.) Britton.**

Potomac Flats west of railroad, June 3, 1900.

**1045a. *Carex festucacea* Willd.**

One clump, Massachusetts avenue extended, May 26, 1899; also a clump near railroad north of Kenilworth June 3, 1900; in the latter specimen the culms are taller and somewhat nodding. Determined by Professor Wheeler.

**1045b. *Carex alata* Torr.**

Swampy flat at Jackson City, east of road, June 18, 1896 and June 14, 1897; Mount Vernon, 1901.

**1045c. *Carex albolutescens* Schwein.**

Kenilworth swamp, June 20, 1898, overripe; also above Hyattsville, in swamp west of creek.

**875. *Peltandra Virginica* (L.) Kunth.**

In specimens from the Potomac flats and from above Aqueduct Bridge the seeds, as first noticed by Mrs. Steele, are nearly black when ripe, not green, as stated in the descriptions.

**\*879a. *Lemna perpusilla* Torr.**

Abundant in still water near canal at Widewater, October 3, 1899, and at Chautauqua.

**\*879b. *Lemna minor* L.**

What I take to be this species occurs in the old fish pond together with *Spirodela*.

**986. *Eriocaulon decangulare* With.**

Formerly very abundant at Brightwood swamp. Found also at Takoma Park and in one or more of the Paint Branch swamps.

**986a. *Eriocaulon septangulare* With.**

Abundant on the tide beach at Four Mile Run, July 31, 1896.

**976. *Juncus Torreyi* Coville. (*J. nodosus* var. *megacephalus* of Ward's Catalogue.)**

Jackson City and Howard Hill reservoir.

**\*978a. *Juncus Canadensis brevicaudatus* Engelm.**

Boggy ground at Bennings, September 7, 1899. Determined by Mr. Coville.

**960. *Tofieldia racemosa* (Walt.) B. S. P.**

One of the Paint Branch swamps, September, 1899, 1900.

**958. *Stenanthium robustum* S. Wats.**

Abundant in the Hyattsville swamp west of the creek; collected in fruit August 23, 1900.

**936. *Melanthium Virginicum* L.**

Formerly in Terra Cotta Swamp; now abundant in the swamps south of Arlington; also north of Berwyn.

**936. *Veratrum viride* Ait.**

Magnolia Run, and in a swampy pasture on the Columbia Pike, south part of Arlington.

**947. *Unifolium Canadense* (Desf.) Greene.**

Seen abundantly along the banks of a stream in Suitland in 1899 and 1900.

**944. *Polygonatum commutatum* (R. & S.) Dietr. (*P. giganteum* of Ward's Catalogue.)**

Even small plants growing on uplands seem to belong to this species rather than to *P. biflorum*.

**934. *Smilax glauca* Walt.**

In a note under this species Britton and Brown refer to "a form with numerous small prickles on the lower part of the stem, and more elongated, sometimes halberd-shaped leaves", named *S. spinulosa* by J. E. Smith. I was hereby reminded of a plant I had found at Bennings, and by further observations I learned that the young stems of *S. glauca* frequently have the leaves narrowed, commonly to a lanceolate and long-acuminate form, and that, with or without the peculiar leaves, such stems are apt to be prickly.

**\*924a. *Narcissus biflorus* Curtis.**

Near Kalorama Heights, May 14, 1899. This is a genuine escape, as a good many plants were found scattered about a grassy field.

**928. *Iris cristata* Ait.**

Seven Locks and Little Falls on the Virginia side.

**\*928a. *Iris Pseudacorus* L.**

Has spread from the old fish pond into a tributary ditch.

**931a. *Sisyrinchium Atlanticum* Bicknell.**

Takoma Park, May 27, 1900; Kenilworth swamp, June 3, 1900.

**931. *Sisyrinchium angustifolium* Mill.**

A remarkable display of this plant was seen on a hill on the Conduit road in 1900. Some of the clumps, which were very numerous, must have contained 200 or more culms. The spathes were deep purple.

**901. *Habenaria clavellata* (Michx.) Spreng.**

A good many specimens were found in a moist place part way up the ascent at Arlington August 11, 1896. Since found in small quantity near the Reform School, at Magnolia Run, and in the woods adjoining the river marsh, Bennings.

**902. *Habenaria flava* (L.) A. Gray.**

Woods on river marsh, Bennings; a good supply.

**903. *Habenaria ciliaris* (L.) R. Br.**

Before its discovery in Kenilworth swamp I was told by a resident of Takoma Park that this plant grew near the railroad station there, in the spot where I later found it.

**904. *Habenaria lacera* (Michx.) R. Br.**

One or two specimens on high ground, Cabin John. A larger amount in Kenilworth swamp and in the swamp north of Beaver Dam branch. Also a specimen at Magnolia Run.

**\*904a. *Habenaria peramoena* A. Gray.**

A single specimen at Feeder Dam.

**910. *Gyrostachys simplex* (A. Gray) Kuntze.**

Connecticut Avenue Bridge, August 26, 1897; Ardwick, September 6, 1897.

**915. *Achroanthos unifolia* (Michx.) Raf.**

Glen Echo Heights (Mrs. Steele), September 13, 1899, in fruit.

**917. *Leptorchis Loeselii* (L.) MacM.**

Fruiting specimens were found in the Howard Hill reservoir, July 2, 1898, and on the Leesburg pike toward Great Falls, September 18, 1899.

**867. *Populus grandidentata* Michx.**

Terra Cotta and Lakeland.

**868. *Populus deltoides* Marsh.**

None of the specimens I have met with are clearly native. A male and female, perhaps forty feet high, stand on the flats at the iron bridge over Rock Creek near Massachusetts avenue extended, and other examples occur on the Potomac flats.

**866. *Salix purpurea* L.**

One tree was found on the Potomac flats east of railroad, April 20, 1900.

**833. *Quercus macrocarpa* Michx.**

The only tree I have seen stands in the woods on the bluff above the canal, at the District line.

**838. *Quercus prinoides* Willd.**

Specimens about two feet high, in flower, Bladensburg, May 17, 1898; also banks of Rock Creek above Military road and on the adjacent ridge, the last much larger.

**806. *Celtis occidentalis* L.**

The only specimen known to me stands by the road half a mile above Cabin John.

**806a. *Celtis pumila* Pursh.**

The restoration of this species by Mr. E. J. Hill (Bull. Torr. Club, 27: 496) is welcome. Common in the up-river region; seen also at Marshall Hall and on the Giesboro Road. Mainly on the flats but sometimes on the bluffs.

**\*811a. *Morus alba tatarica* Sieb. & Zucc.**

A tree thus determined by Mr. Sudworth stands in the waste ground below the old observatory, and the same variety occurs along the Canal road. It fruits freely.

**807. *Humulus lupulus* L.**

Field near Tenleytown Junction; roadside south end of Chain Bridge;

'Captain Jones' place near Chevy Chase Lake. Also on a brook above the Dalecarlia reservoir remote from dwellings.

\*807a. *Humulus Japonicus* Sieb.

Waste ground, September 30, 1890, pistillate flowers.

816. *Parietaria Pennsylvanica* Muhl.

High Island and slope above Canal road.

\*787a. *Asarum reflexum ambiguum* Bicknell.

Moist woods, different places near District line on Cabin John R. R., May 28, 1901.

781. *Rumex verticillatus* L.

Flats above Aqueduct Bridge, Virginia side, June 2, 1896.

\*780. *Rumex Patientia* L.

Dump ground, June 5, 1901.

778. *Polygonum scandens* L.

While some of our specimens have the calyx wings somewhat indented, the great mass of our material certainly belongs to this species. I note in some specimens fruits that are almost wingless mixed with the others. I have one collection which may prove to be *P. cristatum*.

752a. *Chenopodium album viride* (L.) Moq.†

Not uncommon in waste grounds.

753. *Chenopodium Boscianum* Moq.

Woods, Brick Haven, Va., September 3, 1897; first noticed here by Mr. L. H. Dewey.

755. *Chenopodium murale* L.

Found several times in waste places around the city, also at First lock. Rather common at Harper's Ferry.

\*758a. *Chenopodium rubrum* L.

Potomac flats, October 9, 1897; abundant.

758. *Chenopodium anthelminticum* L.

I have found only a single specimen belonging to this species. Mr. Dewey also found one on the experiment grounds of the Department of Agriculture. The absence of bracts from most of the racemes, as well as the greater length of the latter, are essential characters.

\*749a. *Amaranthus blitoides* S. Wats.

Waste grounds, river front near Fourteenth street, September 20, 1897.

749. *Amaranthus graecizans* L. (A. *albus* of Ward's Flora.)

Waste places in and around the city. Seen abundantly in a garden in Suitland.

\*751a. *Acnida tamariscina* (Nutt.) Wood.

I collected in 1897 or 1898 one or two specimens of this species on the Potomac flats dumping ground.

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†*Chenopodium botrys* L. was collected at Harper's Ferry in September, 1900, but I have not yet found it within our limits.

**\*125a. *Portulaca grandiflora* Hook.**

Waste ground, September 19, 1900.

**106. *Silene alba* Muhl. (*S. nirea* of Ward's Catalogue).**

Feeder Dam, Plummer's Island, Rock Creek flats near Captain Jones' place.

**\*109a. *Silene antirrhina divaricata* Robinson.**

Kensington, July 4, 1899; overripe at this date. Probably same, High Island and First lock. Perhaps a good species.

**120. *Sagina decumbens* (Ell.) Torr. & Gray.**

Congress Heights, May 16, 1898.

**121. *Tissa rubra* (L.) Britton.**

Crevices in sidewalk, head of Fourth street; road west of Georgetown.

**124a. *Scleranthus annuus* L.**

Street north of old observatory, May 1, 1898.

**\*38a. *Cabomba Caroliniana* A. Gray, var.**

Leaves of this plant were collected by Mr. Dewey and myself in Beaver Dam Branch near its entrance to Eastern Branch in September, 1897, but its identity was not then made out. I collected the plant in flower September 1, 1900, in the river a little below the Navy Yard Bridge. As *Cabomba* is known to have been planted in the Eastern Branch for use in aquaria, it has doubtless spread from that source, and it may now be considered as established. There is a specimen in the National Herbarium from one of the fish ponds, collected by Dr. Vasey, which is said to be introduced from the Patapsco River.

Our plant has the decided peculiarity that all of the floating leaves except the two lowermost, and sometimes these also, are lobed at the base, giving the leaf a sagittate form. In the ordinary descriptions these leaves are said to be entire, but Gray in the *Illustrated Genera* says "or emarginate". The cleft in our plant perhaps never reaches down to the petiole, but it is usually far deeper than would be indicated by the term emarginate. The specimen from the Patapsco River seems to have the same peculiarity. Some of the material planted in the Eastern Branch is said to have been brought with goldfish from Japan, but this is probably a mistake, as there is no species of *Cabomba* reported from that country. This is presumably a form or variety of *C. Caroliniana*, but it would be interesting to know where it is native.

**24. *Delphinium tricornes* Michx.**

A single plant on the mainland near Plummer's Island, Maryland side, May 13, 1900.

**26. *Aconitum uncinatum* L.**

Near Tenleytown Junction, on Glen Echo Heights, and near Linnaean Hill road.

**\*9a. *Anemone Canadensis* L.**

Woods below Congress Heights, May 25, 1898, in a moderate patch.



1. *Clematis ochroleuca* Ait.

On the ridge at Four Mile Run; hill near St. Asaphs; Arlington near Naucks, and woods west of Georgetown (one plant).

13. *Ranunculus pusillus* Poir.

Border of pond, Bladensburg pike, May 4, 1898.

12. *Ranunculus obtusiusculus* Raf.

Eastern Branch marsh at Bennings road, south side.

22. *Ranunculus acris* L.

Though occasionally found, I doubt if this is well established at any point within our range.

15. *Ranunculus micranthus* Nutt.

Hillside above Chain Bridge; near Kendall Green.

6. *Thalictrum purpurascens* L.

Feeder Dam Island; Plummer's Island; Seven Locks. This is a gregarious plant of rank growth, although not very tall.

\*7a. *Thalictrum coriaceum* (Britton) Small.

Common on hillsides, among thickets, etc.

5. *Thalictrum dioicum* L.

Well-shaded banks, Rock Creek Park; Little Falls on the Virginia side.

40. *Papaver dubium* L.

Plummer's Island; abundant along New-cut road near Conduit road and on a neighboring estate May 30, 1899.

45. *Fumaria officinalis* L.

Occurs occasionally in waste ground, and was found in considerable quantity in the truck land near Belleview Magazine, and even on the uncultivated hillsides, in 1898.

\*76a. *Lepidium apetalum* Willd.

Waste ground, Holmead Manor, May 15, 1898; dumping ground, river front, May 28, 1898; Eckington, May 25, 1900.

78. *Thlaspi arvense* L.

Potomac flats, one specimen, 1900. This plant is evidently not established here.

\*78a. *Thlaspi perfoliatum* L.

Waste ground north of Virginia avenue, May 15, 1898; a considerable patch.

68a. *Sisymbrium altissimum* L.

Below the old Naval Observatory, in fruit, June 7, 1897; since seen in several places, but apparently not spreading.

\*74a. *Brassica Napus* L.

Becoming very abundant.

\*74b. *Brassica juncea* (L.) Coss.

Chain Bridge station, July 4, 1896; later at Anacostia and on dumping ground on the Potomac flats.

**52. *Barbarea Barbarea* (L.) MacM.**

A form corresponding to *B. vulgaris arcuata* A. Gray was collected on a roadside at Cleveland Park, May 14, 1899.

**52a. *Barbarea stricta* Andr.**

Potomac flats near dumping ground, May 11, 1898.

**49a. *Roripa hispida* (Desv.) Britton.**

Jackson City, August 1, 1899.

**62d. *Cardamine arenicola* Britton.**

Very abundant in moist ground on the Potomac flats east of the railroad, 1900.

A *Cardamine* appearing intermediate between this and *C. Pennsylvanica* and growing on dry wooded hills requires further attention.

**62a. *Cardamine parviflora* L.**

Woods, Kendall Green.

**72a. *Camelina microcarpa* Andr.**

This name applies to all the specimens I have seen, and probably to all those formerly taken as *sativa*. This plant was observed quite overrunning a field on New-cut road east of Conduit road, May 30, 1899.

**56. *Arabis patens* Sulliv.**

South slope of the High Island ridge, in fruit, May 21, 1898.

**71. *Erysimum cheiranthoides* L.**

Plummer's Island, June 22, 1897; Potomac flats, July 10, 1899.

**\*71a. *Conringia orientalis* (L.) Dumort.**

A single specimen on dumping ground, rear of propagating grounds, in 1899.

**\*79a. *Cleome spinosa* L.**

Dumping ground on New-cut road, July 14, 1899. Seen in the previous year near Pennsylvania avenue southeast, and in 1900 on dumping ground along the river front.

**249. *Spiraea salicifolia* L.**

This can no longer be considered rare, as it has been observed in Kenilworth swamp in small quantity; at the foot of the long hill on the Glen Echo railroad; in a swamp in south Arlington; near Sligo, Maryland (Pollard); and on the edge of a bog north of Berwyn.

**254. *Rubus argutus* Link.**

Our common high-bush blackberry. I am as yet uncertain whether or not we have *R. nigrobaccus* Bailey.

**\*256a. *Rubus trivialis* Michx.**

Bennings, and swamp above Hyattsville.

**254a. *Rubus Enslenii* Tratt. (*R. villosus humifusus* of Ward's Flora.)**

High ground near Dalecarlia reservoir, May 15, 1896; Seven Locks, May, 1897. Later found at Lakeland, etc., and probably very common. Trattenick's and Torrey's type specimens, as shown in Bailey's "Evolution of our Native Fruits," pp. 363 and 376 differ as to the form of the leaves. Both forms can be duplicated from our material. Our plant has

commonly one blooming stem of last year's wood, a young shoot for the year to come, and often a dead stalk of the preceding year. Fruiting stem often only from one to two feet long and ascending or nearly erect.

\*255a. *Rubus villosus roribaccus* Bailey.

A plant thought to correspond to this name grows near the First lock and on higher ground near the adjacent District line. The stems are 4 or 5 feet long, spreading, not prostrate, sometimes low, but often 2 or 3 feet from the ground. One clear case of rooting at the tip was observed. The prickles are slender, but formidable, especially on less vigorous branches, where they multiply. Only trifoliolate leaves have been observed, but others may exist on young shoots. The leaflets are oval or oblong lanceolate, the larger 3 inches long by 1½ inches wide, doubly serrate with cuspidate teeth, finely appressed pubescent beneath, in a less degree above. The splendid flowers have the petals (including the claw) an inch long, suborbicular, slightly ovate or obovate. Fruit not yet seen. The whole plant is on a larger scale than *R. villosus* (*R. Canadensis* of authors) and when it is well known it will certainly be regarded as a distinct species. Possibly it is a different plant from Professor Bailey's.

261. *Geum vernum* (Raf.) Torr. & Gray.

Woods north of Glen Echo railroad, April 20, 1900.

267. *Alchemilla arvensis* (L.) Scop.

A few specimens in dry ground near Holmead swamp, 1898.

\*268a. *Agrimonia mollis Bicknellii* Kearney.

Linnaean Hill road, August 18, 1899. I had noticed the peculiarity of this form before I saw its description by Bicknell (Bull. Torr. Club 23: 547, 1896).

264. *Rosa humilis lucida* (Ehrh.) Best.

I have specimens at least approaching this variety, from beside the railroad near Cowdon's station, south Arlington.

278a. *Malus angustifolia* (Ait.) Michx.

A small tree apparently of this species stands west of the railroad on the edge of the dumping ground at Eckington, (May 25, 1900). The leaves almost duplicate those of a specimen from Florida so determined by Nash. There is a specimen in the U. S. National Herbarium, collected I think by Dr. Parry in 1871, credited to the District of Columbia. If this determination proves correct it will be a fair question whether the trees mentioned in Ward's Flora as *Pyrus coronaria* are not also of this species.

\*287a. *Amelanchier spicata* (Lam.) Dec.

Great Falls, May 30, 1899, in fruit. Mr. Sudworth says he has found this near the city.

281. *Crataegus cordata* (Mill.) Ait.

Roadside, Riggs road beyond the Northwest branch; a grown tree with numerous progeny.

**\*283. *Crataegus rotundifolia* (Ehrh.) Bork.**

Dry woods, Riverdale, May 19, 1901. Specimen seen also from beyond Tenleytown

**\*285. *Crataegus flava* Ait.**

Roadside, south Arlington, July 8, 1899, in fruit.

**\*285b. *Cotoneaster pyracantha* (L.) Spach.**

Two bushes along a fence, New-cut road near Conduit road, May 30, 1899. I looked in vain for fruit in November, 1900.

**\*246a. *Prunus cuneata* Raf.**

Bank of ditch one mile north of Berwyn, May 6, 1900.

**\*246b. *Prunus Avium* L.**

A large spreading tree thought to belong to this species, Glen Echo Heights, in flower, April 29, 1900. Also a large specimen with the habit of a forest tree, either *P. Arium* or *P. Cerasus*, in the woods above Aqueduct Bridge, Virginia side. Both these species, according to Mr. Sudworth, have run wild here.

**\*246c. *Prunus Mahaleb* L.**

In the valley east of Cleveland Park, May 7, 1896; now destroyed. Border of the Woodley woods toward Cleveland Park, May 11, 1899, with green fruit.

**199a. *Trifolium dubium* Sibth.**

Near Conduit road beyond the District line, May 15, 1896; not then recognized. Later near Cleveland Park, etc.

**\*196a. *Trifolium incarnatum* L.**

Roadside, Bladensburg pike, May 17, 1898.

**\*200a. *Amorpha fruticosa* L.**

A well-grown specimen stood in waste ground at the rear of the propagating grounds, and was in flower May 28, 1898.

**\*217a. *Meibomia arenicola* Vail.**

Dry bank, Suitland, September 8, 1898.

**\*217b. *Meibomia glabella* (Michx.) Kuntze.**

Hillside above First Lock, August 31, 1897; Woodley Park, September 15, 1899.

**\*223a. *Lespedeza Nuttallii* Darl.**

Woodley Park, August 27, 1897; near Ardwick, September 6, 1897; Paint Branch region, September 3, 1900. The collection here extends its known range.

**\*219a. *Lespedeza frutescens* (L.) Britton.**

A narrow-leaved and a broad-leaved form.

**220a. *Lespedeza striata* (Thunb.) H. & A.**

Since the publication of Ward's Flora this has been introduced, and has spread far and wide. On gravel along railroad tracks it sometimes takes the form of a mat.

**\*226a. *Vicia villosa* Roth.**

On dumping ground, September 2, 1897; seen frequently since.

**225. *Vicia tetrasperma* (L.) Moench.**

Takoma Park, 1896; Giesboro road, 1899.

**226. *Vicia hirsuta* (L.) Koch.**

Waste ground, Potomac flats; among the truck lands below Anacostia.

**224. *Vicia sativa* L.**

I have plants with narrow and with broad leaves; the latter are perhaps distinct from *V. angustifolia* Roth, but the separation is not easy.

**\*229a. *Vigna Catjang* L.**

Found occasionally on dumping grounds.

**231a. *Falcata Pitcheri* (Torr. & Gray) Kuntze.**

Abundant in the river swamps; also occurs near streams back from the river.

**229b. *Dolichos Lablab* L.**

Found on several occasions on dumping grounds.

**153a. *Oxalis corniculata* L.**

Abundant on the Agricultural grounds not far from the building. Collected with flowers and fruit December 4, 1900.

**153b. *Oxalis filipes* Small.**

Common. Blooms from May to the end of September, the stem gradually elongating and falling over, but not rooting. My specimens show pretty clearly, however, that this plant develops some short, creeping stems.

**153. *Oxalis stricta* L.**

Common. Begins blooming a little earlier than *O. filipes*, and seems to finish mainly by the end of June, but it is found more or less in flower throughout the summer, the stem elongating moderately. It forms little clumps of stems with a decumbent base which may be two or three inches long. Besides the transverse ridges there are two well-defined longitudinal ridges on the face of the seed and a groove on its margins.

**153c. *Oxalis cymosa* Small.**

Very common. Begins to blossom late in May and continues throughout the season, the stem elongating greatly.

**153d. *Oxalis grandis* Small.**

Plummer's Island, June 22, 1897.

**144a. *Linum medium* (Planch.) Britton.**

More abundant than *L. Virginianum*, the species easily distinguishable. The difference between these plants was clearly explained in Ward's Flora.

**\*99b. *Polygala cruciata* L.**

Brightwood swamp, August 16 and September 22, 1897. Also in the Paint Branch swamps in some quantity, and at Lakeland.

**97. *Polygala viridescens* L.**

Flats opposite Alexandria, July 1, 1899. Only station found by me.

**99a. *Polygala Curtissii* A. Gray.**

Addison Heights, July 22, 1890, abundant. Also at Bennings and Bladensburg. Perhaps our most common species.

**100b. *Polygala Nuttallii* Torr. & Gray.**

Near Brightwood swamp, July 24, 1897; since collected on the flats opposite Alexandria, and one mile north of Berwyn. It seems to prefer the vicinity of swamps.

**102a. *Polygala Senega latifolia* Torr. & Gray.**

Common. Our plant, however, seldom has the leaves "2 inches long", and some specimens growing with the others have the leaves nearly or quite narrow enough for the type.

**801. *Phyllanthus Carolinensis* Walt.**

This plant can no longer be regarded as rare. I have collected or observed it on denuded banks in the up-river region, on the electric road near St. Asaph's, on the gravelly flats, especially west of the road at Jackson City (abundant), at a point on Riggs road near Northwest Branch, and near Bladensburg.

**\*801a. *Crotonopsis linearis* Michx.**

In a flat moist field perhaps three-quarters of a mile north of Berwyn, July 28, 1900.

**802a. *Acalypha gracilens* A. Gray.**

The smaller grayish leaves (often broader than would be expected from the figure in Britton and Brown's Flora), and the slender outer branches of the typical form separate this fairly from *A. Virginica* in general appearance. The protrusion of the staminate flowers from the involucre is not a reliable character, as some of the finest *Virginica* I have seen has them well exerted. On feeble plants or branches the involucre is sometimes almost obsolete. A low, stout form of this species occurs on broken ground without the slender branches, and with an abundance of small leaves and fruit.

**\*800a. *Euphorbia dentata* Michx.**

Sandy field, Seven Locks, September 25, 1897; waste ground, river front, very abundant in 1900. Common about Harper's Ferry. The variation in the width of the leaf is quite extraordinary.

**798. *Euphorbia Ipecacuanhae* L.**

Sandy knoll, Hyattsville, east of creek. May 1, 1898; near Lutheran Home, May 11, 1901.

**799. *Euphorbia dictyosperma* Fisch. & Mey.**

Near Captain Jones' place beyond Chevy Chase Lake, and in great abundance in a meadow opposite Forest Glen, May 17, 1900.

**305a. *Callitriche heterophylla* Pursh.**

What I take to be a form of this was collected in a warm pool at Great Falls, May 30, 1899. The broad leaves are entirely absent. Normal form, Bladensburg, June 27, 1897.

**184. *Rhus aromatica* Ait.**

This plant is rather common around Harper's Ferry, and also in the

vicinity of Manassas, and may therefore be looked for on our southern border as well as in the up-river region, where, as reported by Ward, our only specimen has been found.

■ 63. *Euonymus Americanus* L.

Common. I enter this name in order to note that the *E. Americanus* *oboratus* of Ward's Flora is doubtless a mistake, as the true *oboratus* is very distinct, and its occurrence here, so far as I know, has not been confirmed.

■ 176a. *Acer pseudo-platanus* L.

Spontaneous along New-cut road in the hollow above Georgetown College grounds; leaves collected November 11, 1900.

■ 74. *Acer saccharum* Marsh. (*A. saccharinum* of Ward's Catalogue.)

A tree of some size, but partially blown over was seen in a ravine as Widewater; also a grown tree in a similar condition on Plummer's Island. Many seedlings were scattered about the last named locality.

■ 178a. *Cardiospermum Halicacabum* L.

Dumping ground, Eckington, July 28, 1898. Also later at different places on the Potomac flats.

155. *Impatiens biflora* Walt. (*I. fulva* of Ward's Catalogue.)

Many specimens with pinkish and mottled flowers were found growing with the ordinary form on boggy ground at Bennings, September 7, 1899.

172. *Vitis rupestris* Scheele. (*V. vulpina* of Ward's Catalogue.)

Near Great Falls and Chain Bridge.

138a. *Sida hermaphrodita* (L.) Rusby. (*Sida Napaea* Cav.)

Potomac flats, both sides of the railroad and near the old fish pond, July 27, 1896, and later.

142a. *Hibiscus Syriacus* L.

Escaped on the grounds of the old observatory (July 6, 1898), and probably elsewhere.

142r. *Hibiscus Trionum* L.

Propagates itself in my yard, where it was planted several years ago.

\*142c. *Gossypium herbaceum* L.

Waste ground, Potomac flats, October 25, 1900; several plants with flowers and ripe bolls.

129a. *Hypericum densiflorum* Pursh.

A few good plants in the bog one mile north of Berwyn, July 28, 1900. The bushes were about five feet high.

133a. *Hypericum majus* (A. Gray) Britton.

Howard Hill reservoir, August 26, 1896.

80. *Hellanthemum Canadense* (L.) Michx.

Kenilworth, Suitland, and near Takoma Park. I do not find the species easy to distinguish when in fruit, but the Takoma specimens, the only ones seen in flower, belonged to *H. Canadense*.

81. *Lechea minor* L.

I have failed to find this plant anywhere except at Lakeland, where I

saw a few individuals. It is possibly not rare; but I suspect that the material formerly referred here belongs partly or wholly to one of the following species.

**81a. *Lechea racemulosa* Michx.**

Hyattsville, September 7, 1896; later at Lakeland, Congress Heights, and in the Paint Branch region. Plants gathered at the last station September 3, 1900, have the fruit and leaves of *racemulosa*, but are most remarkable in habit, forming low, bushy, and extremely dense clumps, heavily laden with fruit. A few specimens in the National Herbarium somewhat approach them. They were on ground which had been burned over the previous year.

**81b. *Lechea tenuifolia* Michx.**

Addison Heights, July 25, 1896. Probably our most common species.

**\*88a. *Viola Brittoniana* Pollard.**

Moist ground north of Berwyn, May 6, 1900; later seen near Lakeland. Adding these stations to that of Mr. Pollard's at Hyattsville, it may be expected that this violet will be found at intervals along the low ground from Bladensburg to Berwyn and perhaps farther.

**86c. *Viola sororia* Willd.**

Woods, Forest Glen, May 17, 1900.

**82. *Viola lanceolata* L.**

Bennings, both in the wet ground near the railroad and the low ground towards the river; low ground above Riverdale.

**86a. *Viola affinis* LeConte.**

Abundant in woods at foot of bluff on the Giesboro road some distance beyond Congress Heights, April 27, 1899. Seen also on the Potomac flats east of the railroad.

**84. *Viola cucullata* Ait.**

Boggy ground beyond Silver Hill, May 25, 1899, and at points in Suitland.

**\*84a. *Viola laetecaerulea* Greene, n. sp.**

Acaulescent, with short, stout, branching rootstock, the foliage at time of petaliferous flowering upright, 4 to 7 inches high, distinctly hirsutulous, the young and growing peduncles, petioles, and cucullate unexpanded leaves often rather densely so: leaves from rounded or subreniform-cordate to cordate-ovate, and  $1\frac{1}{4}$  to  $2\frac{1}{4}$  inches long, evenly and very distinctly crenate, obtuse, light green; peduncles stoutish, scarcely equalling the petioles; sepals oblong, obtuse, very narrowly scarious-margined, often more or less plainly serrulate-ciliolate; petals rather broad, well rounded, indistinctly veined, the odd one very conspicuously shorter and every way smaller than the others, all light-blue, the lateral ones with a strong tuft of hirsute subclavate or perhaps flattened white hairs; apetalous flowers and their capsules on short horizontal and more or less completely subterranean peduncles; capsules oblong.

In sandy loam, open ground, Potomac flats below Long Bridge, a few clumps only, these closely associated with an abundant growth of *V.*



*papilionacea*. Specimens were collected April 27, May 1, and May 10, 1900, those of the first date not yet in full bloom, those of the last past their prime. Apetalous flowers May 28, 1901. Duplicate type material is deposited in the U. S. National Herbarium. In autumn, while *V. papilionacea* was still green and flourishing, no traces of *V. lueteraerulea* could be found; and this again seems to indicate its affinity for *V. cucullata*. However, the plant is certainly a near relative of the common and very beautiful *V. papilionacea* of Pursh. At the same time, it curiously simulates the real *cucullata*, that is, the glabrous pale-green blue-flowered bog-meadow violet, in not only the color of the corollas and the pale-green herbage, but even in the form of the leaves, length of leaf-stalks, etc., etc.

The species is to me the most interesting new one of all that I have been called upon to name and describe in recent years: and this because of the fact that in the volume of LeConte's colored drawings done eighty years since, and now in my possession, just this plant is the subject of one of his most beautiful figures; and I have for several years been wondering when this almost mythical plant, so clear in its specific characters according to LeConte's pencil and brush, would make its appearance, and where it would come from. I had studied the plate so often, and had the character and aspect of the species so well in mind that instantly upon beholding Mr. Steele's specimens, I felt sure of their identity with what LeConte so long ago had drawn and painted, but had never published or even named.

There is, however, a Latin note in LeConte's handwriting under the figure, which may be rendered thus: "Differs from the common *V. cucullata* by the width and rotundity of its petals, the odd one being small, as in *V. palmata*. The petals are not venulose. The petioles are sometimes villous."

In reading this note of his, it must be remembered that by *V. cucullata* LeConte meant not what I have established to be true *cucullata*, i. e., the bog-meadow plant, but rather the *V. papilionacea*.—*Edw. L. Greene*.

### 85a. *Viola domestica* Bicknell.

I find a violet agreeing with the description of this near Captain Jones' place beyond Chevy Chase Lake, at Widewater, and in other places, but my observation tends to confirm the view of Mr. Pollard that this is only a variety or form of *V. papilionacea*.

### 89a. *Viola Labradorica* Schrank. (*V. canina sylvestris* of previous lists.)

A good many plants of this species have grown in a little glen along Rock Creek above the entrance of Piny Branch, where it was noticed especially in 1899. Seen also above Military Road; but it is a scarce plant.

### 325. *Opuntia Opuntia* (L.) Coult.

Plummer's Island, June 22, 1897.

**307. *Rotala ramosior* (L.) Koehne. (*Anmannia humilis* of Ward's Catalogue)**

This plant is common in very wet places along the river (Chautauqua, Jackson City, Hunting Creek, Benning). Instead of the 2 to 6 inches of the Illustrated Flora it grows with us from 6 to 12 inches high, and a similar stature is shown by some specimens in the National Herbarium. It branches freely when there is space, but when crowded the stem tends to be simple. Alternate with the acute divisions of the calyx at its four corners are broad appendages which fold inward over the ovary. The flowers do not seem to be "very small".

**310. *Decodon verticillatus* (L.) Ell.**

In the swamp about the mouth of Oxen Run, August 18, 1900, then coming into bloom: a small number of specimens.

**\*311a. *Chamaenerion angustifolium* (L.) Scop.**

I saw a plant of this species at Takoma Park in 1896 or 1897.

**311. *Epilobium coloratum* Muhl.**

The form *umbrosa* Haussk. was collected at Bethesda, September 9, 1899. The leaves are very large.

**318a. *Kneiffia longipedicellata* Small.**

Near Bladensburg, June 27, 1896. Not rare in the eastern part of our territory. It grows in open ground: when well developed it is a very fine plant, far more handsome than *K. festuca*.

**350. *Aralia racemosa* L.**

Found by me only on Pimmit's Run, where there were a good many fruiting specimens on August 19, 1900.

**\*352a. *Hedera Helix* L.**

A patch of the common ivy was seen in the woods below Congress Heights in 1897 or 1898.

**348a. *Caulis Anthriscus* (L.) Huds.**

Of late years this plant has spread extensively on the Potomac flats, and should it reach cultivated grounds it might prove troublesome.

**\*320a. *Eryngium planum* L.**

There were several specimens on the Massachusetts avenue terrace in the summer of 1899, and also in 1900.

**331. *Sanicula Marylandica* L.**

Near Chevy Chase, at Glenearlyn, and in a ravine at Glen Echo.

**330a. *Sanicula gregaria* Bicknell.**

Fessler Dam Island, May 15, 1896. Also along the river on the Virginia side above Aqueduct Bridge, at Cabin John Bridge, and in a shady valley beyond Cleveland Park, June 2, 1896, at which time I became acquainted with Bicknell's description.

**\*338a. *Foeniculum Foeniculum* L. Karst.**

Seen once on the Canal road and once on the Potomac flats dumping ground. It does not establish itself.

**\*339a. *Chorophyllum bulbosum* L.**

West of the fish pond, with flowers and fruit June 27, 1899, bulbs were

collected the following spring. This plant greatly resembles *Conium maculatum* in general appearance. It seeds freely, and the seeds spring up abundantly around the old plant, but it does not appear to increase much.

**338a. *Scandix pecten-Veneris* L.**

Dumping place near propagating grounds May 3, 1898; also on Massachusetts Avenue extended.

**331a. *Conium maculatum* L.**

Rock Creek ravine near M street bridge, July 11, 1898; very abundant during that and the following season. Also on waste ground near Virginia Avenue, and on dumping ground at New-cut Road.

**\*340a. *Carum Carui* L.**

Two plants were collected on the river-front dumping ground in 1898.

**356a. *Cornus circinata* L'Her.**

A specimen of this species was brought by a lady to the Department of Agriculture from Takoma Park in 1899.

**563a. *Clethra alnifolia* L.**

One of the Paint Branch swamps, September 23, 1899; Berwyn, July 28, 1900; also at another point north of Berwyn, and in considerable quantity near the creek at Lakeland. This fine shrub can therefore be considered as definitely belonging to our flora.

**\*557a. *Azalea viscosa hispida* (Pursh) Britton. (?)**

A plant was found in sphagnum ground south of Four Mile Run, also one at Nauck's, agreeing exactly with some local specimens of *A. viscosa glauca*, except that the flowers were of a rich flesh color instead of pure white. This suggests variety *hispida*; but the specimens seen were of low stature, and the pedicels were not more hispid than those of some specimens of *glauca*.

I am of the opinion that the plant which has passed as variety *nitida* here is only a state of variety *glauca*. This is not to say that there is not a true *nitida* elsewhere.

**556. *Kalmia angustifolia* L.**

One of the Paint Branch swamps. September 3, 1900, in fruit.

**554. *Leucothoe racemosa* (L.) A. Gray.**

The best stations I have found for this plant are: Bennings near the railroad, and flats opposite Alexandria near the bluffs.

**\*544a. *Gaylussacia dumosa hirtella* (Ait.) A. Gray.**

South of the electric road junction, Takoma Park, June 7, 1897. First noticed by Mr. T. H. Kearney on the same occasion. I have not found this plant since.

**\*544b. *Vaccinium atrococcum* (A. Gray) Heller.**

Bennings, April 13, in flower; Kenilworth swamp, May 10 and June 13; in ripe fruit, 1898.

**575. *Lysimachia quadrifolia* L.**

The form with all the leaves opposite was found at Lakeland, July 8, 1900, and seemed to be common.

**577. *Lysimachia Nummularia* L.**

A large patch on a roadside at Bladensburg; also on Potomac flats near the dumping ground.

**572. *Steironema lanceolatum* (Walt.) A. Gray.**

To Professor Ward's localities may be added Kenilworth swamp, and low ground north of Beaver Dam Branch.

**574. *Steironema quadriflorum* (Sims.) A. S. Hitchc. (*S. longiflorum* of Ward's Catalogue).**

Seen by me only on the river bank above Chain Bridge on the Virginia side, coming into bloom July 4, 1896.

**579a. *Centunculus minimus* L.**

A few specimens near Bladensburg.

**601b. *Polypremum procumbens* L.**

One plant at Kenilworth, August 11, 1898.

**603. *Gentiana Saponaria* L.**

I have both stout and very slender specimens (the latter from Takoma Park) which it seems necessary to refer to this species.

**606. *Bartonia Virginica* (L.) B. S. P.**

Kenilworth swamp and one of the Paint Branch swamps.

**589. *Asclepias rubra* L.**

Sparingly in Kenilworth swamp and north of Beaver Dam Branch; also in the Paint Branch region, but more abundant in a swamp on the Columbia pike, south Arlington.

**590. *Asclepias purpurascens* L.**

Glen Echo railroad at foot of the long hill, June 24, 1898.

**596. *Asclepias quadrifolia* Jacq.**

Woods near Chevy Chase railroad and on Plummer's Island; very scarce.

**599. *Ampelanus albidus* (Nutt.) Britton.**

Not rare along the canal, and once observed near Tenleytown Junction. Also in various places at Jackson City, where fruits were collected September 21, 1898.

**601. *Vincetoxicum hirsutum* (Michx.) Britton. (*Gonolobus*, of Ward's Catalogue.**

On a bluff off from the Giesboro road, May 20 and July 22, 1899. The shape of the cup in the corolla agrees better, however, with that assigned to *V. Canadense*.

**600. *Vincetoxicum obliquum* Jacq. Britton.**

Abundant on the slope above the canal road.

**\*630a. *Quamoclit Quamoclit* (L.) Britton.**

Steadily self-propagating in my yard, also dumping ground, Potomac flats.

**630. *Quamoclit coccinea* (L.) Moench.**

Suitland, cultivated ground, September 8, 1899; later, several places on the dumping grounds.

**631. *Ipomoea hederacea* Jacq. (*I. Nil.*, of Ward's Catalogue.)**

Corn field on the way to Plummer's Island, August 24, 1897; also Great Falls, Jackson City, and Chain Bridge.

**635. *Convolvulus spithameus* L.**

Suitland road and south Arlington, near Cowdon's station.

**640b. *Cuscuta polygonorum* Engelm. (*C. chlorocarpa* of Ward's Flora.)**

Mr. L. H. Dewey collected this plant near Four Mile Run in October, 1898, and he has so determined specimens collected by me on the Potomac flats, August 3, 1900.

**609. *Phlox maculata* L.**

Swampy places in south Arlington; low ground north of Riverdale.

**614a. *Hydrophyllum Canadense* L.**

Ravine at Chain Bridge station, August 1, 1900, in fruit; a limited number of specimens.

**617a. *Phacella dubia* (L.) Small.**

High Island, and at various points in the Seven Locks region.

**616. *Phacelia Purshii* Buckl.**

Plummer's Island, May 31, 1897.

**629a. *Heliotropium Europaeum* L.**

Street in Alexandria, September 28, 1897.

**\*627a. *Asperugo procumbens* L.**

Dumping ground, along the river front at various points, May 3 and May 28, 1898.

**628a. *Lycopsis arvensis* L.**

A single plant in waste ground, U street between Seventeenth and Eighteenth streets, June 16, 1897; also in the previous year, the same individual.

**\*731a. *Scutellaria incana* Muhl.**

Near the canal at Chautauqua, August 17, 1896, then past its prime; not since met with.

**732a. *Scutellaria parvula* Michx.**

Linnaean Hill road, May 18, 1899.

**729. *Scutellaria saxatilis* Ridd.**

Rediscovered on the Virginia shore about a mile above Chain Bridge, October 7, 1900; seen at Harper's Ferry the previous September.

**\*735a. *Dracocephalum parviflorum* Nutt.**

Fugitive specimens were collected on U street in 1896.

**713. *Koeleria mutica* (Michx.) Britton.**

Paint Branch bottom, near Berwyn, September 3, 1900; the only time it has been seen by me. I have collected all the other species mentioned in Ward's Flora.

**\*707a. *Lycopus Sherardi* n. sp. (*L. Virginicus* Michx. and many authors, at least in part; not Linnaeus).**

Perennial by filiform branching stolons bearing pairs of leaves  $\frac{1}{4}$  inch

long or less, often mere bracts; stems erect or ascending, more or less branching, in exceptional cases 3 feet long, commonly from 15 inches to 2 feet, the internodes 1 to 2 inches long, dark green or partly purple, sparingly or rather densely clothed with a short grayish upwardly appressed pubescence; leaves  $1\frac{1}{4}$  to 3 inches long, the upper portion ovate or ovate-lanceolate, with an entire acuminate point  $\frac{1}{4}$  inch long or less, rather coarsely dentate or serrate, below strongly incurved-cuneate and entire, forming a margined petiole of varying length which tapers quite down to the verticillasters; the leaves when young bright purple, becoming dark green; verticillasters many-flowered, commonly very dense, sometimes somewhat looser, small or (perhaps only abnormally) large; flowers very small, the calyx 4-toothed or sometimes 5-toothed, the teeth ovate or narrower, acutish; the corolla long-exserted, distinctly shorter than that of *L. Virginicus*; one or two sterile filaments occasionally, but not always discernible.

The description is based chiefly upon material from the vicinity of Washington, D. C., where the plant is common in mucky soils and on the wet river flats. The exceptionally robust specimens referred to grew on the Potomac flats. The U. S. National Herbarium contains, besides local material, specimens from Maine, Connecticut, West Virginia, Kentucky, Tennessee, and South Carolina, showing a distribution over the coastal plain and southwestward in the mountains, without indication of high altitude.

Linnaeus founded his *Lycopus Virginicus* on Gronovius. The latter in his *Flora Virginica*, edition of 1762, quotes the Linnaean character and that of his own first edition, adding: "Ab hac verticillis magis approximatis, et foliis profundius serratis differt *Lycopus Canadensis* glaber foliis integris dentatis D. Sherard, quae species nomine *Lycopi* flore minimo albo, foliis purpureis glabris acuminatis serratis, odore remisso n. 181 inscripta." As the plant above described is beyond reasonable doubt the same as Sherard's, it seems fitting to note this historical connection in its name. The verticillasters, indeed, are not always "more approximate", but they may very well have been so in the specimens observed by Gronovius, as they are sometimes only an inch apart. The leaf margin is more deeply toothed than in *Virginicus*, the flower is smaller than in any other of our species, and the leaves are the only decidedly purple ones I have seen and are smooth and acuminate. The stem is indeed not glabrous, but the pubescence is not very obtrusive, and would not make a strong point against a description in most respects so good. I have made no note regarding the odor.

#### 707. *Lycopus Virginicus* L.

I have made a partial study of the remaining *Virginicus* material in my possession and in the National Herbarium, and the judgments formed may perhaps be of interest. Excluding for the present *L. macrophyllus* Benth., and variety *quercifolius* Pursh, the remaining material includes some forms which considered by themselves might seem worthy of specific distinction. But these distinctions are not borne out, and some of our local material can scarcely be placed on one side of the line rather

than the other; nor do I find even varietal differences. Bentham's *macrophyllus*, on the other hand, seems likely to be at least a good variety. The leaves are much enlarged and sinuate-lobed. If this merely occurred here and there with the type we might explain it as due perhaps to a combination of shade and rich soil; but on the contrary it has a somewhat self-consistent range which is far from identical with that of the type, namely, from Oregon eastward through Nebraska and Minnesota to northern and central Michigan. There is also a Missouri specimen that seems to belong to this. Bentham cites Pursh's variety *quercifolius* as a synonym, of which the locality is given as the high mountains of Virginia. As the National Herbarium contains no specimen from that region, I can express no opinion concerning it. It is conceivable that this plant of rather northern range is represented in the Allegheny Mountains, however. If the two are found identical, the name *quercifolius* would take precedence of *macrophyllus*.

**\*708. *Lycopus rubellus* Moench.**

River swamp, foot of First street, southeast, September 21, 1890; Hunting Creek and Eastern Branch swamp at M street extended, September, 1890. There is also a specimen in the National Herbarium collected by Dr. Vasey near Chain Bridge. The specific name doubtless refers to the pinkish color of the stem.

**\*709. *Lycopus Europaeus* L.**

Virginia shore of the Potomac above Aqueduct Bridge, September 29 1900, two specimens.

**\*705 *Mentha Piperita* L.**

"The Point" at Jackson City, and on the Canal road; not abundant in either locality.

**\*706a. *Mentha rotundifolia* (L.) Huds.**

Cultivated ground in front of the Agricultural building, 1900.

**\*644a. *Physalis Ixocarpa* Brot.**

Neglected ground near dwellings, water front at foot of Fifteenth street, September 30, 1890. It fruited abundantly and appeared again in 1900.

**\*644b. *Physalis Virginiana* Mill.**

This species or one which I cannot distinguish from it sometimes grows on very low ground, even in the river marsh. On the Potomac, flats (August 8, 1890) stems a yard long, lying prostrate on the ground, were observed. The ordinary form, above the railroad trestle beyond Chevy Chase Lake, September 12, 1900.

**\*642a. *Solanum Dulcamara* L.**

Seen by me only as a dump plant along the river front in 1890.

**\*642b. *Solanum pseudocapsicum* L.**

A number of specimens of the Jerusalem cherry were found on the margin of dumping grounds on New-cut Road, November 11, 1900. Some were in fruit, and there were a few flowers. The plant probably escaped from the refuse of some greenhouse.

**648a. *Capsicum* sp.**

A single plant was found in the last-mentioned locality; it was taken home and replanted, and bore fruit of a conical form.

**\*648b. *Petunia violacea* Lindl.**

A purple petunia, doubtless of this species, appears occasionally on the dumping grounds.

**\*662a. *Gratiola sphaerocarpa* Ell.**

Pond near Bladensburg pike, May 17, 1898; ditch at Lakeland, Md., August 4, 1900; scarce.

**\*662a. *Gratiola viscosa* Schwein.**

Eastern Branch swamp south of Bennings road, August 29, 1899; M street extended, September 16, 1899; mouth of Beaver Dam Branch, August 11, 1900. Abundant, especially in the last locality.

**663a. *Ilysanthes attenuata* (Muhl.) Small.**

Jackson City, August 1, 1899; Bennings, August 29, 1899, less common than *I. gratioloidea*. Though on young stems of *gratioloidea* the peduncles scarcely exceed the leaves and though on old branches of *attenuata* the peduncles may exceed them, on the whole the peduncles of the former are much longer, sometimes a full inch in length. In my specimens the leaves of *attenuata* are larger, and it has a much greater tendency to root at the nodes.

**664. *Micranthemum micranthemoides* (Nutt.) Wettst. (*M. Nuttallii* of Ward's Catalogue).**

Still growing at Hunting Creek, September 4, 1899.

**667. *Veronica scutellata* L.**

Feeder Dam, July 22, 1897.

**679. *Pedicularis lanceolata* Michx.**

Still found at Hunting Creek, September 4, 1899, at that date just coming into flower.

**686a. *Utricularia subulata* L.**

Howard Hill reservoir, abundant, May 22, 1899.

**\*686b. *Utricularia biflora* Lam.**

Specimens collected on the flats at Chain Bridge, August 16, 1899 and August 1, 1900, seem to belong to this species, and an earlier collection near the Second lock is perhaps the same. If this determination is correct it would throw some doubt upon the existence of *U. gibba* recorded in Ward's Flora, although of course it is possible we have both.

**\*688a. *Catalpa Kaempferi* Sieb. & Zucc.**

A tree determined by Mr. Geo. B. Sudworth as a hybrid of this species stands near Virginia Avenue and Eighteenth street, appearing as if spontaneous.

**\*692a. *Martynia Louisiana* Mill.**

Dumping ground, river front, August 22, 1900, a single plant; in fruit later. Flowers rather small and numerous; perhaps not this species.

**691. *Ruellia strepens* L.**

A remarkable plant perhaps belonging to this species was collected



near the canal at First lock, June 9, 1897. The flowers are single and borne on leafy-bracted axillary peduncles after the manner of *R. pedunculata* Torr. The calyx segments, however, are lanceolate, not awn-like, and the bracts, though much larger, have about the form of those found in the flower clusters of *R. strepera*.

**689. *Ruellia ciliosa* Pursh.**

My material includes a simple-stemmed cinereous plant found in dry woods, the calyx-segments very hirsute, and a coarser plant with spreading and geniculate-ascending branches, found in open and moister ground, with the calyx-segments less hirsute.

**\*373a. *Oldenlandia uniflora* L.**

Bennings, low ground toward the river swamp, August 29, 1899.

**376. *Galium Claytoni* Michx.**

Eastern Branch Swamp. Doubtless the *G. trifidum* of Ward's Flora.

**\*382a. *Galium tinctorium* L.**

South Arlington near Cowdon's station, June 5, 1898; near Silver Hill, May 28, 1899.

**\*620b. *Asperula arvensis* L.**

A single specimen found on dumping ground in 1897 or 1898.

**\*363a. *Viburnum molle* Michx.**

Kenilworth, June 11, 1899; also at First Lock, near Tenleytown Junction, in Terra Cotta swamp, and near Eckington. I present this name with great confidence, notwithstanding the fact that the stellate pubescence in our plant is almost obsolete on the under side of the leaf and often scanty elsewhere. It holds out best on the petioles of the upper leaves and on the peduncles. In one collection from Terra Cotta there are remains of a soft stellate pubescence in the axils of the veins on the lower leaf surface; but usually the pubescence in this situation appears simple and undistinguishable from that of *V. dentatum*. A specimen came to the Department of Agriculture from near Baltimore with a thin soft stellate pubescence on the whole under surface of the leaf. The pubescence on the petioles is stiff and very different, although also stellate. In two distinct cases this species was found flowering when *V. dentatum* was advancing into fruit. In one instance *dentatum* seemed to be blooming late. I have not fully verified the fruit characters, but the drupe seems larger than the *V. dentatum*.

**\*360a. *Viburnum cassinoides* L.**

A bush found in the sphagnous ground at Takoma Park was in flower while the more common *nudum* was in bud, and being in other respects different from that species, appears fairly to belong to *V. cassinoides*.

**365. *Triosteum angustifolium* L.**

I have had one or two specimens from the railroad level at Glen Echo.

**369. *Lonicera Japonica* Thunb.**

Found near Naucks with decidedly red flowers.

**383. *Valeriana pauciflora* Michx.**

Abundant on Plummer's Island as well as on High Island.

**386. *Valerianella radiata* (L.) Dufr.**

Great Falls, May 30, 1900,. Also Potomac flats and Mount Vernon.

**\*324a. *Micrampelis lobata* (Michx.) Greene.**

Waste ground, July 21 and September 19, 1898.

**\*543b. *Campanula rapunculoides* L.**

In an old graveyard, Woodley, June 13, 1896; neglected ground, Massachusetts Avenue extended, June 13, 1899.

**543a. *Campanula aparinoides* Pursh.**

Tenleytown Junction and Glen Echo Heights, in swales.

**543. *Campanula Americana* L.**

On the slope above Canal road, and I think also on Pimmitt Run.

**\*529a. *Lactuca hirsuta* Muhl.**

Flats opposite Alexandria; Linnean Hill road, etc. The pubescence in our plant appears to be confined to the stem, except for a few hairs on the midrib of the veins beneath.

**\*525a. *Crepis pulchra* L.**

This appeared in some quantity in June, 1898 and 1899, on the dump near the propagating grounds.

**\*524a. *Hieracium Marianum* Willd.**

One or two specimens believed to be this were collected in 1896 in the woods on the Virginia shore of the Potomac some distance above Aqueduct Bridge.

**525. *Hieracium paniculatum* L.**

Woods near one of the runs at Takoma Park, August 11, 1897; hillside east of Zoological Park, August 3, 1897. The specimens of the latter collection were remarkable on account of the relatively stout stem and elongated panicle.

**\*533a. *Nabalus albus integrifolius* (Cass.) Britton.**

Bladensburg, September 6, 1896; Glen Echo Heights, September 3, 1899.

**470a. *Xanthium strumarium* L.**

Plants collected at Rosslyn, September 13, 1900, come within the description of Britton and Brown; and others collected near the canal at the District line September 18, 1896, I would on the whole also refer here. The *X. strumarium* of Ward's Flora must have been mainly *X. Canadense*.

**388. *Vernonia noveboracensis* (L.) Willd.**

Common in low ground. For the sake of comparison with the next, I note here that this species is frequently of a bushy habit, the stem emitting straight, slender, ascending branches, bearing the heads clustered at the ends; that the inflorescence is composed of such branches, only shorter, and that when the stem is more strict it still tends to send out some such branches from the axils below the inflorescence proper; that the leaves vary somewhat in width and amount of pubescence beneath, but not surprisingly; that the awns of the involucrel bracts are rather flexuous, erect in bud, later usually conspicuously spreading, but rarely

reduced in length to mere cusps; and finally, that the pappus is of a purple brown color, fading grayish.

388a. *Vernonia glauca* (L.) Britton.

*Serratula glauca* L.

*Vernonia Noreboracensis latifolia* A. Gray.

*Vernonia Noreboracensis tomentosa* Britton. Not *Chrysocoma tomentosa* Walt., nor *Vernonia tomentosa* Ell.

Mostly on hills; Linnaean Hill road, Rock Creek Park, Glen Echo Heights, and various points on the Virginia side of the Potomac. Also at Harper's Ferry, particularly on Maryland Heights, at an altitude of 1,000 feet. I have given much outdoor attention to this plant, and as it does not seem to be well understood, I subjoin a revised description:

Stem slender to medium stout, strict nearly or quite to the inflorescence, striate-angled, puberulent. Leaves light green above, pale and puberulent or glabrate beneath, the larger from 5 to 7 inches long, and from 1½ to nearly 3 inches wide, the upper portion oblong or oval, acuminate or at least acute, below more or less abruptly incurved-contracted into a margined petiole tapering nearly or quite to the insertion, the narrow portion of variable length; the upper leaves smaller and more nearly cuneate at the base; inflorescence spreading and rather flat-topped, the branches stout, zigzag, densely puberulent, sometimes a little tomentose; involucre about 3 lines broad, the scales cuspidate, subulate-acuminate, or short-awned, the exposed portion purple throughout, or green with purple edges and tips, webby-ciliate, the awn, when present, often more or less upwardly barbellate; pappus straw-colored, from nearly white to a rather bright yellow; achenes from one-fourth to one-fifth as thick as long.

The diagnosis in the Hortus Elthamensis of Dillenius, upon which the Linnaean *Serratula glauca* was based, alludes to the light-colored pappus, but recent authorities have taken no account of this conspicuous and substantial character, nor do they seem to have attached any importance to the peculiar contraction of the lower part of the leaf, nor to have laid any stress upon the difference, in comparison with *Noreboracensis*, in the habit and inflorescence. As to the involucral scales, the copious material examined shows that they are commonly either abruptly contracted into a short or long cusp, or gradually narrowed to a subulate point with no fast line between the two types, the cuspidate form being, however, the more common. This account, moreover, is sustained historically; for the figure in the Hortus Elthamensis represents the bracts, not, indeed, as awned, but as subulate-acuminate, and Dr. Gray states that "the [Linnaean] specimen has many aristate-tipped bracts". To accept Dr. Britton's description of the bracts as "acute or mucronate" would be to throw out a large part, if not all of the material I have seen, and indeed to leave much of it without a name; for aside from the fact that it is not *Noreboracensis* at all, a large portion would be excluded from the variety *tomentosa* Britton by the characters, "leaves densely puberulent beneath" and "involucre purple", as the pubescence is not generally very dense, and the involucre is not seldom

predominantly green. Further than this, the *Chrysocoma tomentosa* of Walter and the *Vernonia tomentosa* of Elliott are narrow-leaved plants. Elliott lays stress on this character, and Walter's expression is so distinct that nothing short of clear herbarium evidence could justify us in referring to his species a plant with the leaves above described. Besides this, the National Herbarium contains two specimens that are almost certainly the *tomentosa* of Elliott, and barring herbarium evidence unknown to me, probably that of Walter also. They are characterized by their linear-lanceolate, scantily and finely serrate leaves, which are whitish or grayish tomentose beneath, and by the rough and tomentose inflorescence, almost exactly the characters given by Elliott. Mr. T. H. Kearney, Jr., who collected one of these specimens in southern Virginia, states that it is the most hydrophile of the [eastern] Vernonias, actually growing in shallow water. Elliott's plant correspondingly grew in ditches. The awns of Mr. Kearney's specimen are broken off, but in the other specimen of the two above referred to, collected by C. F. Hyams in South Carolina, the awns are present and well developed, although I am not prepared to say that they are longer than in normal *Noveboracensis*. I am accordingly inclined to regard Elliott's species as valid, and Mr. Kearney also favors that view.

There is in the National Herbarium a specimen collected by Professor Alexander Winchell in Alabama, which has the pappus and the leaf-form of *V. glauca*, though the leaves are rather smaller; but the latter are densely puberulent and the awns are long for *glauca*. This might be the variety *tomentosa* of Britton were it not for the long awns; it belongs, however, not to *Noveboracensis*, but to *glauca*.

### 390c. *Eupatorium maculatum* L.

Kenilworth, September 27, 1898. My specimens fail to show the flat-topped corymb.

### \*395a. *Eupatorium serotinum* Michx.

The only station known to me for this species is a point on the Eastern Branch flats a mile above Benning's road.

### 391a. *Eupatorium altissimum* L.

Specimens from Bethesda Park and elsewhere agree in form of leaf with the figure in Britton and Brown's Flora; but collections from along the river at Glen Echo, Chautauqua, and Great Falls show a remarkable broadening of the leaf without increase of length. The width sometimes reaches 1½ inches. Compare *Kuhnia eupatorioides*.

### \*400a. *Eupatorium cannabinum* L.

A single specimen on the edge of the tide-bed at Hunting Creek on the Alexandria side, a few rods from the wagon road, September 4, 1899. Only a part of the plant was taken and it may be found again.

### 403. *Kuhnia eupatorioides* L.

Specimens were collected September 18, 1899, on the side of the ravine at Difficult Run with the larger leaves ovate-lanceolate, contrasting widely with the linear-lanceolate form which is common here. This

form is mentioned in Gray's Synoptical Flora. In the original description the leaves are characterized as broadly lanceolate.

**404. *Lacinaria scariosa* (L.) Hill. (*Liutris* of Ward's Catalogue).**

A few specimens from the roadside and the side of the ravine at Difficult Run, September 18, 1890. This, with previously reported collections, proves that this plant truly belongs to our flora, and is perhaps native.

**405. *Lacinaria graminifolia* (Walt.) Kuntze.**

Specimens with white corollas were found east of Bladensburg pike, September 25, 1898.

**410. *Solidago flexicaulis* L. (*S. latifolia* of Ward's Catalogue).**

Plummer's Island and the declivity on the Virginia side above Chain Bridge.

**\*423a. *Solidago Elliottii* Torr. & Gray.**

In swamp at Kenilworth, September 18, 1897; also above Hyattsville on the west side of the creek, on Paint Branch about three miles above Berwyn, and in Suitland. The specimens agree reasonably with each other and with the description.

**\*423b. *Solidago neglecta* Torr. & Gray.**

Kenilworth swamp, September 18, 1897; also in one of the Powder Mill swamps, and at Hyattsville, east side of creek.

**415. *Solidago rigida* L.**

The station in Woodley Park, on the slope facing the bridges, has for some years afforded a good many specimens, but is in danger of obliteration from close pasturing.

**\*412a. *Solidago juncea ramosa* Porter & Britton.**

A few specimens near the Glen Echo railroad in 1896.

**411. *Solidago nemoralis* Ait.**

Specimens with erect instead of recurved racemes, giving the plants a very unusual appearance, were collected September 23, 1890, near the Soldiers' Home. It may be compared with the preceding.

**\*423c. *Solidago Canadensis procera* (Ait.) Torr. & Gray.**

Near the Rockville railroad beyond Bethesda, September 30, 1900.

**\*428a. *Aster divaricatus persallens* Burgess.**

A form near this was collected August 27, 1890, south of Four Mile Run near Cowdon's.

**\*428b. *Aster Schreberi* Nees.**

Plants supposed to be this were collected August 18 and September 27, 1890, on the Linnaean Hill road.

**\*438a. *Aster cordifolius alvearius* Burgess.**

Canal road, and bluff on the Virginia shore above Chain Bridge.

**\*434a. *Aster undulatus loriformis* Burgess.**

This or an approximating form, Upper Paint Branch, September 23, 1890; also various places in the Rock Creek region.

**\*431a. *Aster phlogifolius* Muhl.**

Woodley Park, September 28, 1896, not then recognized; Linnaean Hill road, September 27, 1899; high land a mile or two from Great Falls, Maryland side, October 3, 1899.

**448. *Aster Novae-Angliae* L.**

Abundant at points on the Conduit road. A fine growth also on the Potomac flats in 1900.

**\*445. *Aster puniceus firmus* (Nees) Torr. & Gray.**

Tide marsh, Brick Haven, October 10, 1896; foot of First street south-east, September 21, 1897.

**446. *Aster prenanthoides* Muhl.**

At various points up the river, from near Chain Bridge to Great Falls, particularly across the canal at Cabin John. Never abundant.

**\*433a. *Aster laevis Potomacensis* Burgess.**

Connecticut Avenue Bridge, September 21, 1896; M street extended near Eastern Branch, September 16, 1899; Leesburg pike near Difficult Run, September 18, 1899.

**429a. *Aster elodes* Torr. & Gray.**

Very abundant in boggy ground. It is time to break the habit of calling this a variety of *A. Nori-Belgii*.

**\*429a. *Aster Radula* Ait.**

Not only at the main Paint Branch station (here first collected by Mr. H. W. Olds, I think,) but also a mile further east. In boggy ground at Suitland, September 8, 1899, I found a much altered form with but one to three heads, the leaves merely very finely scabrous.

**442. *Aster salicifolius* Lam.**

Feeder Dam, Hunting Creek, and Great Falls. This is, of course, the *A. carneus* or *A. astirius* of Ward's Flora, but I have not met with anything to match the other name.

**\*443a. *Aster paniculatus acutidens* Burgess.**

Potomac flats, October 9, 1897.

**430. *Aster lateriflorus* (L.) Britton. (*A. miser* of Ward's Catalogue.)**

Of the now recognized varieties, I think I can distinguish *grandis* Porter, from Alexander's Island, and *pendulus* (Ait.) Burgess, from Takoma Park.

**450. *Doellingeria umbellata* (Mill.) Nees.**

Takoma Park, mainly near electric railroad junction, October, 1898, 1899. Rare.

**450a. *Doellingeria humilis* (Willd.) Britton.**

Rather common in boggy ground, Terra Cotta, Benning, etc. The leaves of this species are not relatively as broad as might be expected. This I suspect is wholly or in part the *Diplopappus umbellatus* of earlier record.

**449. *Doellingeria infirma* (Michx.) Greene. (*Diplopappus cornifolius* of Ward's Catalogue).**

The specific name doubtless refers to the procumbent tendency of one

form. This habit seems surprising in the same species with forms that are rigidly erect, but I have failed to find other differences.

**\*463a. *Polymnia Canadensis radiata* A. Gray.**

Specimens with manifest but not conspicuous rays were collected at Glen Echo, July 16, 1897.

**\*480a. *Helianthus microcephalus* Torr. & Gray.**

Thicket on the slope south of Four Mile Run near Cowdon's, August 8, 1899.

**485. *Helianthus decapetalus* L.**

Besides the form with thin and ample leaves this has a form with the leaves smaller and firmer; the latter was collected near Cowdon's station.

**482. *Helianthus strumosus* L.**

Glen Echo railroad, Connecticut Avenue Bridge, bluffs near Little Falls, M street extended near Eastern Branch. Some of the specimens have considerable pubescence on the under side of the leaves, but it is doubtful whether they are the true variety *macrophyllus*.

**482. *Helianthus hirsutus* Raf.**

There is a well-defined sunflower common in our region for which Britton and Brown's Flora, so far as I can see, makes no provision, but which might very well come under *H. hirsutus* as defined in the Synoptical Flora. According to the latter the stem is "commonly smooth below, rough and hispidulous above", according to the former the stem is "densely hirsute". In our plant, which is of branching habit, the stem is smooth and sometimes glaucous below, or with mere vestiges of roughness, the branching part rough and at the extremities somewhat hirsute. The leaves are broadest near the base and long-tapering, scabrous with prickles above and scabrous-pubescent with sparse white horn-shaped hairs beneath. I have little doubt that the description in the Synoptical Flora was intended to cover a plant essentially the same as ours. That of the Illustrated Flora is more true to Rafinesque, but it leaves our plant without a name.

**490. *Coreopsis tinctoria* Nutt.**

An occasional escape. South Washington and the Potomac flats dumping ground.

**494a. *Bidens connata* Muhl.**

Borders of a pond between Arlington and the river, August 24, 1896; Bennings, September 7, 1899.

**\*494b. *Bidens comosa* (A. Gray) Wiegand.**

Pond below Arlington, September 14, 1896; Jackson City, September 4, 1896; Bladensburg pike, September 16, 1899.

**493. *Bidens discolor* (Torr. & Gray.) Britton. (*Coreopsis* of Ward's Catalogue).**

Bennings, in boggy ground on the flats, September 7, 1899.

**493a. *Bidens* sp.**

A single specimen agreeing with some of the material under *B. aristosa* in the National Herbarium was found on the brink of the water at

Great Falls on the Virginia side, and later a few specimens lower down. It has not yet been determined.

**502a. *Chrysanthemum Parthenium* (L.) Pers.**

Canal road near Georgetown, July 9, 1899; dump ground, June 5, 1901.

**\*502e. *Chrysanthemum Balsamita* L.**

Vacant ground, corner of Fifteenth street and Florida avenue, September 1, 1899.

**\*501a. *Tanacetum vulgare crispum* DC.**

Seventh street road beyond Brightwood, August 2, 1899; seen also at Great Falls. I am not sure that I have seen the type here.

**\*502d. *Artemisia annua* L.**

Glen Echo, between the carriage and electric roads, September 25, 1897, abundant; also a few specimens in South Washington, about the same date, and later near Eastern Branch at Pennsylvania avenue.

**502c. *Artemisia vulgaris* L.**

Roadside, Rosslyn, August 8, 1899.

**503. *Arnica acaulis* (Walt.) B. S. P. (*A. nudicaulis* of Ward's Catalogue).**

Takoma Park, south of the electric road junction, May 19, 1897; seen also on the slope south of Four Mile Run near the Southern railroad, and at a point east of Takoma.

**5102. *Arctium tomentosum* (Lam.) Schk.**

Dumping ground, river front, June 22, 1898; not common. Our ordinary species seems to be *A. minus* Schk.: *A. Lappa* as now understood I do not find.

**517. *Centaurea Calcitrapa* L.**

Various places in South Washington; seen also on the Bladensburg pike not far from G street.

**\*514a. *Carduus nutans* L.**

South Washington, east of gate to the Arsenal grounds, June 23, 1897. I took some pains to destroy the plant, and do not know whether it survived.

**512a. *Carduus odoratus* (Muhl.) Porter.**

This maintains a precarious existence in Woodley Park.



PROCEEDINGS  
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JUNCUS COLUMBIANUS, AN UNDESCRIBED RUSH  
FROM THE COLUMBIA PLAINS.

By FREDERICK V. COVILLE.

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At the request of Professor C. V. Piper, of Pullman, Washington, I publish at this time a description of a *Juncus* from the Columbia Plains, which belongs to the difficult and perplexing group of which Watson's *Juncus nevadensis* is the best known representative.

***Juncus columbianus* sp. nov.**

Plant perennial, 20 to 70 cm. high, tufted, erect; rootstocks about 2 mm. in diameter, horizontal, the yearly growth commonly 1.5 to 3 cm.; stems nearly terete, commonly 1.5 to 2 mm. in diameter at the base, much slenderer above, with 1 or 2 or rarely 3 leaves; basal leaves few, sheaths with broad membranaceous margins, auricles conspicuous, 2 to 3 mm. long, and blades terete, sometimes 20 cm. in length, inconspicuously nodose, usually erect; cauline leaves similar to the basal, the upper with shorter blades; leaves of the inflorescence reduced to scarious bracts, the lowest occasionally with a herbaceous blade; inflorescence rarely exceeding 7 cm. in height, bearing commonly 4 to 8 or sometimes even 20 glomerules, rarely reduced to a single one; perianth 3 to 3.5 mm. in length, at maturity of a pale reddish brown color or stramineous, its parts narrowly lanceolate with setose apex, stamens 6 or sometimes reduced to 3 by the abortion of those opposite the inner perianth parts,

the anthers about as long as the filaments, often a little longer: style conspicuous, about 2 mm. in length: capsule equaling the perianth or a little shorter, cinnamon-colored or sometimes castaneous at the apex: narrowly oblong, acute at the apex, the style usually persistent and its basal portion developed into a distinct beak though not splitting with the dehiscence of the capsule: seed pale brown, oblong, 0.4 to 0.5 mm. in length (the body about 0.3 mm. long), the outer coat with a tendency to be loose, reticulated in about 20 to 26 longitudinal rows, the areolae usually isodiametrical, transversely plurilineolate.

Type specimen in the United States National Herbarium, collected July 20, 1896, in wet meadows near Pullman, Washington, by A. D. E. Elmer (No. 235).

*Juncus columbianus* differs from typical Californian *Juncus nevadensis* in the paler color of its flowers, comparatively shorter anthers, less well-defined beak of the capsule, and much paler seeds with nearly twice as many rows of areolae, always trans-lineolate. The recently described *Juncus suksdorfii* Rydberg\* is another plant of the same group, more closely resembling *nevadensis* than *columbianus*. It is distinguishable from the latter by its greater size and robustness, its height commonly 60 to 100 cm. and the annual growth of its rootstocks 5 to 10 cm., usually larger inflorescence, and almost always dark brown longer perianth 4 to 5 mm. in length, anthers much longer than the filaments (commonly 2 to 3 times as long), and body of the capsule not plainly visible at maturity at the mouth of the perianth, as is usual in *columbianus*.

The specimens of *Juncus columbianus* in the National Herbarium are as follows:

Washington:

Klickitat County, "springs, Columbia River," W. N. Suksdorf, August 8, 1881.

Klickitat County, near Columbus, W. N. Suksdorf, June 10, 1886.

Douglas County, Egbert Spring, altitude about 1300 feet, Sandberg and Leiberg, July 1 and 5, 1893 (Nos. 358, 388).

Douglas County, Wilson Creek, Lake and Hull, August 6, 1892 (No. 389).

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\*Rydberg, Bull. Torr. Club, 26: 541. 1899.

*Coville—Juncus Columbianus, an Undescribed Rush.* 89

Spokane County, near Spangle, *W. N. Sukdorf*, June 30, 1884.

Spokane County, Marshall Junction, *C. F. Piper*, July 2, 1896 (No. 2281).

Whitman County, Pullman, *A. D. E. Elmer*, July 20, 1896 (No. 235).

**Oregon:**

Gilliam County, Pine Creek, *J. B. Leiberg*, June 8, 1894 (No. 196).

Blue Mountains, *W. C. Cusick*, June, 1884 (No. 1201).

**Idaho:**

Nez Perces County, along Hatwai Creek, *J. H. Sandberg*, May 27, 1892 (No. 261).

**Montana:**

Gallatin County, Bozeman, *P. A. Rydberg*, July 22, 1895 (Nos. 2210, 2212a).



PROCEEDINGS  
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THE GENERIC NAMES MYRMECOPHAGA AND  
TAMANDUA, AND THE SPECIFIC NAMES  
OF THE OPOSSUMS OF THE  
GENUS DIDELPHIS.

BY J. A. ALLEN.

In the 'American Naturalist' for February, 1901 (pp. 143-145), Mr. Oldfield Thomas refers to recent articles by Mr. Rehn and myself concerning the names *Myrmecophaga* and *Didelphis*. Without going into the matter with sufficient care I assented\* to Mr. Rehn's contention† that the Linnæan *Myrmecophaga* was not tenable for the Great Anteater, known as *Myrmecophaga jubata* Linn., but I have to confess that I had not access to Marcgrave, and gave the matter only passing attention, as my special question at the time was the status of the genus *Didelphis*. As Mr. Thomas has shown, *Myrmecophaga* is perfectly tenable for the Great Anteater, and its proper specific name is *tridactyla* Linn. 1758 (*jubata* Linn. 1766). In concluding his notice of *Myrmecophaga*, he says: "As a result I claim that *Myrmecophaga tridactyla* Linn. should be the name for the Great Anteater, *Uroleptes* and *Cyclopes* remaining as before for the other genera of the family."

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\*Bull. Am. Mus. Nat. Hist., XIII, p. 185, Oct., 1900.

†Am. Nat., XXXIV, p. 185, July, 1900.

It appears to me, however, that *Uroleptes* is not the proper name to take the place of *Tamandua* Gray, 1825, where it stands as a *nomen nudum*, becoming only properly habilitated, as shown by Dr. Palmer, by Lesson in 1842. In this case *Uroleptes* has undoubted priority over *Tamandua*, but it appears that F. Cuvier in 1829,\* used the same name, slightly varied in orthography, for the same group one year earlier than the publication of *Uroleptes*. Cuvier recognized three genera of his family "Les Myrmécophages," namely: (1) "Les Tamanoirs, *Myrmecophaga* Linn.," (2) "Les Tamanduas, *Tamanduas*," and (3) "Les Didactyles, *Didactyles*." *Myrmecophaga* included only the Great Anteater, the genus being properly attributed to Linnaeus. *Didactyles* is the same as *Cyclopes* Gray, 1821, leaving the second genus, *Tamanduas*, for the other members of family, namely the Tamanduas of naturalists. The name *Tamanduas* is used in as strictly a technical sense as either of the other names adopted by Cuvier for the other members of the family Myrmecophagidae, and I see no reason why the name *Tamanduas* is not tenable from Cuvier, 1829, for the group of Anteaters included in *Uroleptes* by Wagler one year later.

Respecting the name *Didelphis*, I am gratified to find that Mr. Thomas supports my contention† for its tenability. A word, however, respecting the earlier specific names applied to various members of this group. As is well known Linnaeus's *D. marsupialis* was a composite group based on references to (1) the Virginia Opossum, (2) the Guiana Opossum, and (3) the large Mexican Opossum, the latter being the Tlacuatzin of Hernandez. It appears to me that the most satisfactory way of dealing with this composite group is to follow the usual method, whether the group be specific or generic, namely, the principle of elimination. The name *marsupialis* must, of course, be retained for some member of the composite group. As the first member to receive a special name was the Guiana Opossum, named *Didelphis karkinophaga* by Zimmermann in 1783, this name should be applied in a specific sense to the large Opossums of northeastern South America. The next member of the original *marsupialis* group to receive a name was the Virginia

\*Dict. des Sci. Nat., LIX, p. 501, 1829.

†Bull. Am. Mus. Nat. Hist., XIII, pp. 183-188, Oct., 1900.

Opossum, named *D. virginiana* by Kerr in 1792. This leaves of the identifiable forms included under the original *D. marsupialis* Linn. the large Opossum of Mexico, namely the Tlacuatzin of Hernandez, to which the name *marsupialis* must evidently be restricted. As *D. kariginophaga* has obtained some currency for the large Opossums of northeastern South America, and as *D. virginiana* has been currently accepted for the Opossum of the United States, the present ruling very little disturbs the nomenclature of the group. The restriction of *D. marsupialis* to the large Mexican Opossum simply takes the place of *Didelphis californica* of Bennett, which as a specific designation has never had much currency.\*

\*For a fuller discussion of this case see Allen, Bull. Am. Mus. Nat. Hist., XIV, pp. 163, 164, June, 1901.





PROCEEDINGS  
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A NEW SHREW FROM SWITZERLAND.\*

BY GERRIT S. MILLER, JR.

Among some shrews from Switzerland recently purchased by the United States National Museum is a strikingly characterized species of *Crocidura* to which none of the names based on members of the genus can be applied. It may be called:

*Crocidura mimula* sp. nov.

*Type*.—Adult female (skin and skull) No. 105,801, United States National Museum. Collected at Züberwangen, St. Gallen, Switzerland, December 1, 1900, by Ernst H. Zollikofer. Original number, 192.

*Characters*.—Form, dentition, and general appearance as in *Crocidura russula*, but size conspicuously less (hind foot only 12 (11), greatest length of skull 16 instead of 19-21).

*Color*.—Entire dorsal surface sepia, faintly darker over lumbar region, the hairs showing bright silvery reflections when held in certain lights. Underparts dull ochraceous-buff, not sharply contrasted with color of sides. Chin whitish. The bases of the hairs are everywhere blackish slate, but this color does not appear at surface except irregularly and indistinctly on belly. Feet yellowish white. Tail ochraceous-buff, its upper surface tinged with sepia.

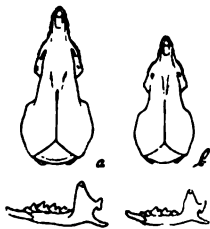


FIG. 1.—a. *Crocidura russula*, b. *C. mimula* (natural size).

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*Skull and teeth.*—Although scarcely larger than that of *Sorex minutus*, the skull of *Crocidura mimula* retains the general form characteristic of *C. russula*. The rostral portion, however, is relatively shorter and wider than in the larger animal. In the type specimen the antorbital foramina are larger and more conspicuous, particularly when the skull is viewed from above, than in any of the specimens of *C. russula* with which I have compared it.

Teeth as in *Crocidura russula*, except for their noticeably smaller size.

*Measurements.*—External measurements of type: total length, 105; head and body, 72; tail vertebrae, 33; hind foot, 12 (11).

Cranial measurements of type: greatest length (exclusive of incisors), 16 (21);\* greatest postorbital breadth, 7.8 (10); greatest antorbital breadth, 5.6 (7); least interorbital breadth, 3.8 (4.4); mandible, 8.4 (11); entire maxillary toothrow, 7.4 (9.4); entire mandibular toothrow, 6.8 (9).

*Specimen examined.*—One the type.

*Remarks.*—*Crocidura mimula* requires no special comparison with *C. russula*, as its size and the form of its skull serve to distinguish it at a glance.

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\*Measurements in parenthesis are those of the skull of an adult female *Crocidura russula* from St. Gallen.

PROCEEDINGS  
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THE ALPINE VARYING HARE.\*

BY GERRIT S. MILLER, JR.

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In the first century B. C. the varying hare of Switzerland was described by Varro.† It was known also to Pliny;‡ and, in fact, nearly all writers on the mammals of Europe down to the present time have mentioned the animal. When the varying hare of northern Europe became known it was supposed to be the same as the Swiss animal, so that the names *timidus* Linnaeus, *alpinus* Erxleben, and *variabilis* Pallas, were applied collectively to both. Melchior§ is apparently the only writer who has questioned this assumed identity. Five specimens of the Swiss hare in the United States National Museum show conclusively that the species is distinct from that of Sweden. In memory of its first describer it may be known as:

***Lepus varronis* sp. nov.**

*Type*.—Adult male (skin and skull) No. 105,832 United States National Museum. Collected at Grisons, Heinzenberg, Canton of Graubünden.

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†*De Re Rustica*, III, cap. XII.

‡*Naturalis historia*, III, cap. LV.

§*Den danske Stats og Norges Pattedyr*, p. 79, 1834.

Switzerland, December 5, 1900, by Ernst H. Zollikofer. Original number, 196.

*Characters*.—In winter pelage (summer coat not seen) externally similar to *Lepus timidus* Linnaeus. Skull and teeth smaller and much less robust than in the Swedish animal.

*Color*.—The winter pelage is pure white throughout, to base of hairs, though usually with an inconspicuous sprinkling of black hairs on back and tail. Ears faintly clouded with grayish brown along anterior margin, and conspicuously tipped with black. The black area is about 12 mm. in width, but its boundaries are not clearly defined, and it is noticeably sprinkled with white hairs. A very narrow line of short black hairs borders the eyelids. Whiskers mixed white and black. Soles of feet yellowish brown. Claws rather dark horn-color.

*Skull*.—The skull of *Lepus raronis* is readily distinguishable from that of *L. timidus* by its much smaller size. In fully adult males of the alpine hare the skull is barely larger than in females from the Helsingland, Sweden, while as compared with males from the same locality the basal length is about 12 mm. less. Aside from its size the skull shows numerous differences in form. It is in general less robust and more slender, particularly in the rostral portion. The supraorbital processes are smaller and narrower than in the Swedish animal, a difference which is especially noticeable when skulls of males are compared, but which is also evident in the females. The auditory bullae are relatively a trifle smaller than in *Lepus timidus* and the cribriform portion of the floor of the braincase immediately in front of each is less flattened.

*Teeth*.—The teeth are smaller than in *Lepus timidus*, but I can detect no tangible differences in form.

*Measurements*.—External measurements of type: total length, 582; tail vertebrae, 53; hind foot, 164.

Cranial measurements of type: greatest length, 92 (103)\*; basal length, 77 (86); basilar length, 70 (79); henselion to posterior edge of bony palate, 34 (40); least (lateral) length of bony palate, 6.6 (7); posterior edge of bony palate to hamular, 23 (25); length of incisive foramen, 23 (27); greatest breadth of incisive foramen, 9 (16.4); diastema, 27 (31); zygomatic breadth, 46 (53); least interorbital breadth, 16 (17); greatest breadth of braincase, 32 (34); greatest breadth of both nasals together, 19 (23); least breadth of both nasals together, 13 (16.4); greatest (diagonal) length of nasals, 39 (46); depth of braincase at anterior end of basioccipital, 27 (30); maxillary molar series (alveoli), 17 (20); mandible, 67 (78); diastema, 20 (25); mandibular molar series (alveoli), 18 (21).

*Specimens examined*.—Five, all from the Canton of Graubünden.

*Remarks*.—The Alpine hare differs from the varying hares of northern Europe in the characters that would be expected to result from its relatively limited range and the less favorable conditions under which it doubtless exists.

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\*Measurements in parenthesis are those of an adult male *Lepus timidus* from Helsingland, Sweden.

PROCEEDINGS  
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SIX NEW MAMMALS FROM COZUMEL  
ISLAND, YUCATAN.

BY C. HART MERRIAM.

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Early in April, 1901, E. W. Nelson and E. A. Goldman, while engaged in field work in Yucatan under the auspices of the Biological Survey of the U. S. Department of Agriculture, visited the island of Cozumel and spent two weeks in collecting mammals and birds. During this period they secured 190 specimens of birds and 51 specimens of mammals. The mammals comprise six species, all of which are new. They consist of a Raccoon, a *Nasua*, an Opossum, a Peccary, a Rice Rat, and a White-footed Mouse. With the single exception of the Opossum, all are strikingly distinct from their nearest relatives on the mainland. This is the more surprising in view of the fact that Cozumel is distant only 10 miles from the adjacent shores of Yucatan. The Opossum, Rice Rat, and Mouse are larger than the nearest related forms on the mainland; the Raccoon, *Nasua*, and Peccary so much smaller that they may almost be spoken of as pygmies.

The only mammal heard of which was not secured is a small Gray Fox (*Urocyon*) reported by the natives as rather rare, but more common on the eastern and southern parts of the island. From the accounts it agrees with the Raccoon, *Nasua*, and Peccary in being much smaller than the mainland species,

Mr. Nelson tells me that shortly before his visit a pair of yellow Agoutis were introduced from the adjacent mainland of Yucatan. One of these was seen in the woods near San Miguel by Mr. Goldman.

In 1898 Oldfield Thomas published a list of 5 species of mammals collected on Cozumel by G. F. Gaumer. These are: *Nasua narica* (-*N. nelsoni*), *Didelphis marsupialis* (-*D. cozumelæ*), *Nyctinomus gracilis*, *Chilonycteris rubiginosa*, and *Artibeus perspicillatus* (Proc. Zool. Soc. London, 1888, p. 129). No bats were obtained by Nelson and Goldman.

***Nasua nelsoni* sp. nov.**

*Type* from Cozumel Island, Yucatan, No. 108,520, ♂ old, U. S. National Museum, Biological Survey Collection. April 8, 1901, E. W. Nelson and E. A. Goldman. Original No. 14,673.

*Characters.*—Size small; tail short; color very dark seal brown, grizzled anteriorly.

*Color.*—Upperparts, belly, legs, and tail uniform very dark seal brown; head and shoulders grizzled with golden fulvous; sides of neck and outer sides of arms grizzled with buffy whitish; throat soiled buffy; ears and stripe on side of neck behind ears whitish; chin and nose all round grayish; gray on upper side of nose forking and sending a gray stripe upward and backward over each eye; lower eyelid and small spot between eye and ear gray; gray of chin separated from color of throat by a broad dusky transverse band.

*Cranial characters.*—Skull similar in general to that of *N. narica* from eastern Mexico, but only about two-thirds the size of that species; male with a highly developed, strongly arched sagittal crest; female with smoothly rounded braincase without trace of crest; zygomata and bullae similar to those of *narica* but very much smaller; teeth much smaller, particularly the first and last upper and lower molars; first upper molar not only relatively and actually smaller, but differing markedly in shape, the inner side being cut away anteriorly and posteriorly so that the inner cusp stands out by itself much more narrowly and prominently; first lower molar very small and narrow; last upper molar variable but always narrowly subtriangular, the crown much narrower antero-posteriorly than in the mainland species.

*Measurements.*—Type specimen (♂ old): total length 795; tail vertebræ 355; hind foot 85. Average of 2 males from type locality: total length 780; tail vertebræ 345; hind foot 83. Average of 4 females from type locality: total length 744; tail vertebræ 328; hind foot 79.

*Skull.*—Type specimen (♂): basal length 95; occipitonasal length 95; palatal length 66; greatest zygomatic breadth 61; length of molar series on alveoli 16.5.

**Procyon pygmaeus** sp. nov.

*Type* from Cozumel Island, Yucatan, No. 108,511, ♂ yg-ad., U. S. National Museum, Biological Survey Collection. April 14, 1901, E. W. Nelson and E. A. Goldman. Original No. 14,698.

*Characters*.—Similar in general to *P. hernandezi*, but only about half the size of that animal; chin and throat separated by a strong band of black; tail yellowish with six or seven annulations.

*Color*.—Upperparts grizzled grayish with a yellowish tinge along the middle of the back, and rather uniformly mixed with black hairs; top of head grizzled gray; face marked by usual transverse black bar enclosing the eyes and sending up a short dusky streak to the forehead; the black facial band separated from gray of top of head by a whitish band divided in the median line by dusky; ankles dusky; chin, lips and sides of nose whitish; throat crossed by broad band of dusky; underparts grizzled grayish with a yellowish suffusion; fore feet grayish throughout; hind feet grayish with a brownish suffusion especially on outer side; tail yellowish marked with six or seven dark brown or blackish rings which are faint below and much less black above than in the other species.

*Cranial characters*.—Skull similar in general to that of *hernandezi* but very much smaller; nasals short, expanded and rounded posteriorly; teeth less than half the size of those of *hernandezi*; last upper molar relatively, as well as actually, much narrower; first upper molar relatively smaller so that the middle upper molar is conspicuously larger than the others; premolars above and below more spaced and very much smaller.

*Remarks*.—This pygmy raccoon is by far the most interesting discovery made by Nelson and Goldman on Cozumel Island. While in many respects it is a miniature of its relative of the adjacent mainland, it possesses characters which would distinguish it at a glance, even if of the same size. Among these characters may be mentioned the broad black throat band, the golden yellow tail, the short posteriorly expanded and rounded nasals, and the peculiarities of the teeth.

*Measurements*.—Type specimen (♂ yg-ad): total length 667; tail vertebrae 230; hind foot 90. A ♀ yg-ad: total length 665; tail vertebrae 250; hind foot 97.

*Skull*.—Type specimen (♂ yg-ad): basal length 88; occipitonasal length 88; palatal length (not including spine) 58; zygomatic breadth 59; length of molar series on alveoli 17.

**Didelphis yucatanensis cozumelæ** subsp. nov.

*Type* from Cozumel Island, Yucatan, No. 108,498, ♂ ad., U. S. National Museum, Biological Survey Collection. April 16, 1901, E. W. Nelson and E. A. Goldman. Original No. 14,700.

*Characters*.—Externally similar to *yucatanensis* Allen, but body larger (in 2 ad. ♂s averaging 383, contrasted with 364 in 2 ad. ♂ *yucatanensis*; in 2 ♀s averaging 359 contrasted with 327); tail much shorter (in 2 ♂s averaging 317 contrasted with 354 in 2 ad. ♂ *yucatanensis*; in 2 females averaging 296 contrasted with 370); hind feet same size; skull similar but decidedly larger; *rostrum very much broader; nasals broader and flatter* (especially the anterior  $\frac{1}{2}$ ); posterior roots of zygomata standing out more squarely; zygomatic arm of squamosal larger and more broadly expanded vertically; palate broader; anterior rudiment of auditory capsule (sphenoid bulla) much smaller and more irregular in form.

*Measurements*.—Type specimen (♂ ad.): total length 703; tail vertebrae 324; hind foot 59. Average of 2 males from type locality: total length 700; tail vertebrae 317; hind foot 59. An ad. ♀ from type locality: total length 670; tail vertebrae 299; hind foot 55. Average of 2 females from type locality: total length 655; tail vertebrae 296; hind foot 55.

#### ***Tayassu nanus* sp. nov.**

*Type* from Cozumel Island, Yucatan, No. 108,516, ♂ ad., U. S. National Museum, Biological Survey Collection. April 7, 1901, E. W. Nelson and E. A. Goldman. Original No. 14,664.

*Characters*.—Size small; related to *angulatus* but only about two-thirds as large; color not markedly different from that of *angulatus* except nose and chin which are blacker.

*Color*.—Upperparts finely grizzled black and buffy, with distinct buffy shoulder-stripe (as in *angulatus* and *tajacu*); nose, chin, dorsal stripe (from occiput to tail), ears, and feet, black. The black nose and chin are most conspicuous in the young and are sufficient to distinguish the species from *T. angulatus*.

*Cranial characters*.—Skull short and broad, especially broad posteriorly, with abruptly spreading zygomata and very large bullae. Compared with skulls of *angulatus* from Texas and eastern Mexico, the skull is of nearly the same breadth, but very much shorter, with much more abruptly spreading zygomata (anteriorly), giving a very different physiognomy; relatively larger bullae, and very much smaller molariform teeth, the canines and incisors nearly as large as in *angulatus*. The angle of the jaw is broadly expanded and rounded as in *angulatus*, but differs in having its posterior margin strongly inflexed. In skulls young enough to show the sutures, the nasals are expanded and squarely truncate posteriorly and rather broadly expanded in the middle.

*Measurements*.—Type specimen (♂ ad.): total length 840; tail vertebrae 32; hind foot 178. Average of 3 males from type locality: total length 823; tail vertebrae 30; hind foot 175. An adult ♀ from type locality: total length 780; tail vertebrae 30; hind foot 177. *Skull* of type: basal length 176; basilar length of Hensel 168; palatal length 120; occipitonasal length 189; zygomatic breadth 100; upper molariform series of teeth 52.



***Peromyscus cozumelæ* sp. nov.**

*Type* from Cozumel Island, Yucatan. No. 108,449, ♂ ad., U. S. National Museum, Biological Survey Collection. April 11, 1891, E. W. Nelson and E. A. Goldman. Original No. 14,686.

*Characters.*—Size and tail medium; ears rather large, thin; color dull brown or brownish fulvous; general appearance similar to *P. affinis* Allen,\* but slightly larger and somewhat darker and more uniform in color.

*Color.*—Head and upperparts varying from grayish brown to dull fulvous brown; underparts white, the plumbeous underfur showing through; tail indistinctly bicolor, brownish dusky above, pale yellowish or whitish below (nearly naked); ankles and wrists brownish or dusky; fore and hind feet whitish.

*Cranial characters.*—Skull of medium size, with rather spreading zygomata, strongly set out and angled anteriorly; nasals broad, flattened, ending about on plane of premaxillæ; incisive foramina rather large and open.

*Remarks.*—*Peromyscus cozumelæ* appears to have no very close relative. Externally it resembles *P. affinis* Allen, but is darker and has thinner ears and shorter tail. Cranially, however, it differs materially from any species known to me. Compared with *affinis* it may be distinguished by the broader and more squarely elbowed zygomata, flatter and broader braincase, broader nasals, slightly larger bullæ, and heavier teeth. The incisive foramina show considerable variation. In most specimens they are long and their outer borders are evenly convex. In others they are much more broadly open and the outer border forms an angle at the maxillo-premaxillary suture. In some specimens they are rather short.

*Measurements.*—Type specimen (♂ ad.): total length 180; tail vertebræ 80; hind foot 23. Average of 8 males from type locality: total length 181; tail vertebræ 82; hind foot 23.5.

***Oryzomys cozumelæ* sp. nov.**

*Type* from Cozumel Island, Yucatan. No. 108,462, ♂ ad., U. S. National Museum, Biological Survey Collection. April 8, 1901, E. W. Nelson and E. A. Goldman. Original No. 14,666.

*Characters.*—Size large; similar to *O. aquaticus* Allen, but darker; ears and hind feet larger; tail much longer and darker.

*Color.*—Upperparts dark grayish bistre with pale fulvous suffusion on sides and rump; in old pelage back (especially rump) rusty red; under-

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\*My *Peromyscus musculoides* (Proc. Biol. Soc. Wash., Vol. XII, p. 124, April 30, 1898) appears to be at most only a subspecies of *P. affinis* Allen, from which it differs in slightly larger size, larger ears and longer rostrum.

parts varying from soiled whitish to pale buffy salmon; ears dark brown, darkest on outer half; tail dusky, paler below.

*Cranial characters.*—Skull large and heavy, with strongly marked superciliary beads, long rostrum, and long incisive foramina. Closely related to *aquaticus*, from which it differs in the following characters: anterior roots of zygomata more depressed and less spreading; orbital angle of frontal less marked; posterior part of braincase broader, carrying the lateral beads *outward posteriorly*, so that they form almost a straight line from side of occiput to angle of orbit; incisive foramina longer and more open.

*Remarks.*—Compared with *aquaticus*, the only species to which it bears any near resemblance, the color in fresh pelage is grayer and darker (less golden fulvous), in worn pelage redder—the rump and hinder part of back more rusty; ears and face darker, the face strongly grizzled with black hairs. The underparts are never buffy yellow as in *aquaticus*.

*Measurements.*—Type specimen (♂ ad.): total length 332; tail vertebrae 182; hind foot 35. Average of 5 adults from type locality: total length 315; tail vertebrae 176; hind foot 34.5.

PROCEEDINGS  
OF THE  
BIOLOGICAL SOCIETY OF WASHINGTON

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A NEW BROCKET FROM YUCATAN.

BY C. HART MERRIAM.

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One of the most surprising discoveries made by Nelson and Goldman in their recent explorations in Yucatan and Campeche is a new species of Brocket. The animal differs totally in color from *Mazama sartorii*, the only known species from Mexico and Central America, being grayish or drab instead of red. That so large an animal should remain so long unknown to naturalists is probably due to its habit of living in dense undergrowth in the arid tropical forests, where it is rarely seen, even by the natives. Two specimens were obtained: an adult male from Tunkas, Yucatan, and an adult female from Apazote, Campeche. The relationship of the species to *M. nemorivagus* of South America, I am unable to determine from lack of specimens. The new animal, however, is decidedly larger than *nemorivagus*. It may be known by the following description:

***Mazama pandora* sp. nov.**

*Type* from Tunkas, Yucatan. No. 108,273, ♂ ad., U. S. Nat. Museum, Biol. Survey Coll. Feb. 15, 1901, E. W. Nelson and E. A. Goldman. Orig. No. 14,544.

*Characters*.—Size and ears about the same as in the Red Brocket; color grayish or drab brown; antlers straight spikes (in type specimen

113 mm. long), deeply plicated or furrowed longitudinally; neck haired like rest of body (not scantily as in *M. sartorii*).

*Color*.—Animal drab brown above and below, becoming grayish on neck; hairs of back annulated subapically with pale fulvous; chin, underlip, front of upperlip, inguinal region, and inner sides of thighs and foreleg white or whitish; anal region and upper side of tail dull fulvous; underside of tail white; ears drab brown with white spot or edging at anterior base of opening; muzzle and sides of face drab brown; anterior base of ear, eyelids, and upperlip washed with fulvous; forehead marked with patches of rusty red; foreleg and fore and hind feet dull fulvous.

*Cranial characters*.—Skull similar in general to that of *sartorii* but a trifle larger; rostrum broader, especially anteriorly; nasals decidedly longer; *frontals* very much broader behind orbits; lachrymal larger, the lachrymal depression larger and more evenly rounded (basin shaped), outer edge of squamosal root of zygoma with a strong and abrupt upward curve or bend near base; posterior projection of palate broader; foramina ovale more broadly open and looking more directly downward [in *sartorii* they are narrowed and look more obliquely forward and outward]; basioccipital with a strongly developed constriction or notch on each side immediately in front of condyles; mastoids larger, descending on outer sides of paroccipital processes; molariform teeth larger; crown of 2d lower premolar much longer; crown of 3d lower premolar thicker and larger in every way; true molars nearly the same size as in *sartorii* although the last is slightly larger.

*Measurements*.—Type specimen (♂ ad.): total length 1126; tail vertebrae 140; hind foot 273; height at shoulder 572.

*Skull*.—Type specimen (♂ ad.): basal length 163; occipitonasal length 157; least breadth of frontals between horn cores and orbits 68; breadth across posterior rims of orbits 73.5; breadth of horn cores just below burr 77; zygomatic breadth 82; least interorbital breadth 44; length of nasals 59; joint length of basioccipital and basisphenoid 45.5; length of upper molar series on alveoli 50; length of antler 113. Adult ♀ from Apazote, Campeche: basal length 160; occipitonasal length 161; length of nasals 57.5; breadth of frontals at posterior corner, of orbits 57; least interorbital breadth 39; palatal length 109; length of upper molar series on alveoli 52.5.

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DESCRIPTIONS OF TWENTY-THREE NEW POCKET  
GOPHERS OF THE GENUS *THOMOMYS*.

BY C. HART MERRIAM.

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The Mammal Collection of the U. S. Biological Survey still contains a number of apparently nameless species of Pocket Gophers of the genus *Thomomys*. Most of these are here described. In making the necessary comparisons with other members of the genus I have been greatly assisted by Vernon Bailey.

*Thomomys latirostris* sp. nov.

*Type* from Little Colorado River, Painted Desert, Arizona. No. 11111  
♂ ad., U. S. National Museum, Biological Survey Collection. September 22, 1899. C. Hart Merriam and Vernon Bailey. Original No. 504.

*Characters*.—Size medium; coloration very pale golden fulvous; *rostrum* strikingly broad.

*Color*.—Upperparts uniform pale ochraceous buff without appreciable admixture of black tipped hairs; underparts, feet, and tail whitish.

*Cranial characters*.—Skull unique: heavy, massive and angular but not ridged; *rostrum* broadly expanded and broadest at base, the great breadth being in the premaxillæ; nasals constricted in middle, slightly notched behind, and falling far short of premaxillæ; zygomata moderately spreading, angular, their outer sides parallel; bullæ medium, smaller than in *aureus*; interparietal broadly pentagonal.

*Measurements*.—Type specimen (♂ ad.): total length 232; tail vertebrae 79; hind foot 33.

**Thomomys sinaloæ** sp. nov.

*Type* from Altata, Sinaloa, Mexico. No. 90,745, ♂ ad., U. S. National Museum, Biological Survey Collection. March 28, 1899. E. A. Goldman. Original No. 13,607.

*Characters*.—Size rather large; color dull pale chestnut brown. Related to *cerrinus* from Phoenix, Arizona, but darker and with distinctive cranial characters.

*Color*.—Upperparts dull pale chestnut brown, fading insensibly into paler chestnut fulvous of underparts; region around mouth pale dusky, not sharply contrasted with throat as in *cerrinus*.

*Cranial characters*.—Skull rather large and angular with *strongly spreading depressed and sharply angular zygomata*. Similar in general to *cerrinus* but shorter; zygomata more broadly spreading, more depressed, and with more prominent anterior angle; bullæ smaller.

*Measurements*.—Type specimen (♂ ad.): total length 233; tail vertebrae 73; hind foot 31. Average of 6 adults from type locality: total length 221; tail vertebrae 74; hind foot 31.5.

**Thomomys perditus** sp. nov.

*Type* from Lampazos, Nuevo Leon, Mexico. No.  $\frac{22688}{22689}$ , ♂ ad., U. S. National Museum, Biological Survey Collection. January 22, 1891. C. P. Streater. Original No. 512.

*Characters*.—Size small; color drab gray; related to *toltecus* but smaller, grayer, and with distinctive skull characters.

*Color*.—Upperparts drab gray, strongly mixed with black-tipped hairs and washed on sides with buffy (on sides of shoulders and rump becoming buffy fulvous); region around mouth dusky; underparts and fore legs and feet buffy salmon; hind feet soiled whitish.

*Cranial characters*.—Skull small; braincase broadly swollen; zygomata moderately spreading, the outer sides parallel; interparietal subquadrate; nasals cuneate, notched behind, and ending about on plane of premaxillæ; bullæ medium or rather small. Differs from *toltecus* in having more cuneate nasals which are notched instead of truncate behind, and which end about on plane of premaxillæ instead of falling far short of premaxillæ; post zygomatic notch deeper and broader; upper incisors more prominent.

*Measurements*.—Type specimen (♂ ad.): total length 195; tail vertebrae 59; hind foot 26.5. Average of 5 adults from type locality: total length 185; tail vertebrae 55; hind foot 25.

**Thomomys goldmani** sp. nov.

*Type* from Mapimi, Durango, Mexico. No. 58,075, ♂ ad., U. S. National Museum, Biological Survey Collection. December 15, 1893. E. A. Goldman. Original No. 240.

*Characters*.—Size very small; back bright fulvous; underparts white. Related to *perditus* but color wholly different and cranial characters distinctive.

*Color*.—Upperparts bright rusty fulvous, moderately mixed with dark tipped hairs; underparts white; nose and region around mouth dusky.

*Cranial characters*.—Skull very small; like that of *perditus* but rostrum and premaxillæ decidedly narrower and smaller, and nasals falling short of premaxillæ.

*Measurements*.—Type specimen (♂ ad.): total length 208; tail vertebrae 68; hind foot 30. An adult female from type locality: total length 190; tail vertebrae 60; hind foot 27.

***Thomomys baileyi* sp. nov.**

*Type* from Sierra Blanca, Texas. No.  $\frac{1}{2}$  1111. ♀ ad., U. S. National Museum, Biological Survey Collection. December 28, 1889. Vernon Bailey. Original No. 870.

*Characters*.—Size small; coloration rather pale; upper incisors projecting strongly forward.

*Color*.—Upperparts pale buffy fulvous, varying to ochraceous and strongly mixed with black-tipped hairs; underparts buffy to salmon; region around mouth dusky; inside of cheek pouches and feet whitish; incisors projecting forward.

*Cranial characters*.—Skull small; zygomata widely spreading, sometimes broadest posteriorly; temporal ridges marked; interparietal subquadrate; nasals emarginate behind and ending nearly on plane of premaxillæ; bullæ medium. In general the skull resembles that of *toltecus*, but it may be distinguished not only by the protruding upper incisors, but also by the longer nasals which are notched instead of truncate behind, longer rostrum, broader interorbital region, less bulging occiput, and much wider and more open post coronoid notch of mandible.

*Measurements*.—Type specimen (♀ ad.): total length 220; tail vertebrae 72; hind foot 32. Average of 6 adults from type locality: total length 212; tail vertebrae 68; hind foot 30.

***Thomomys nelsoni* sp. nov.**

*Type* from Parral, Chihuahua, Mexico. No. 96,451, ♀ ad., U. S. National Museum, Biological Survey Collection. September 18, 1898. E. W. Nelson and E. A. Goldman. Original No. 13,035.

*Characters*.—Size medium or rather small; related to *baileyi* but color chestnut instead of yellowish fulvous, and with distinctive cranial characters.

*Color*.—Upperparts pale dull chestnut brown mixed on middle of back with black tipped hairs; underparts same color but much paler; nose and region around mouth abruptly dusky; feet whitish, but *brown of hind leg coming well down over ankle and covering part of foot.*

*Cranial characters*.—Zygomata strongly spreading, broader behind than in front, with well developed anterior angle; temporal impressions marked; interparietal subquadrate becoming subtriangular in old age; nasals narrowly cuneate, notched behind, and falling well short of premaxillæ; bullæ medium; under jaw very long, the postcoronoid notch narrow and completely covered by coronoid process. From *baileyi*, its nearest known relative, it may be distinguished by narrower nasals, narrower interorbital region, strikingly narrower and differently shaped postcoronoid notch, and less protruding upper incisors.

*Measurements*.—Type specimen (♀ ad.): total length 196; tail vertebrae 60; hind foot 28. An adult male from type locality: total length 207; tail vertebrae 59; hind foot 28.5.

***Thomomys cabezonæ* sp. nov.**

• *Type* from Cabezon, San Geronio Pass, California. No. 53,987, ♂ ad., U. S. National Museum, Biological Survey Collection. June 3, 1893. C. P. Streater. Original No. 2906.

*Characters*.—Size medium, but smaller than *perpallidus* or *aureus*; ears rather large; tail long; color varying from buffy ochraceous (as in *aureus*) to dull salmon brown.

*Color*.—Upperparts buffy ochraceous, buffy gray, or even (in the type and darkest specimen of ♂ from type locality) dull drab-brown on back, becoming buffy ochraceous on sides; nose, lips, chin and opening of cheek pouches dusky; underparts varying from whitish to pale salmon.

*Cranial characters*.—Skull small, angular; zygomata moderately spreading, broadest anteriorly and sharply angular in adults; temporal ridges marked; interparietal rectangular, broader than long in immature skulls; nasals long, with straight sides (not constricted), notched behind, and not reaching near tips of premaxillæ; bullæ medium. Compared with *aureus* and *perpallidus* the skull and jaw are strikingly smaller and lighter, the interparietal quadrangular instead of sub-triangular, the bullæ very much smaller. Compared with *perpallidus* the zygomata are much less spreading.

*Measurements*.—Type specimen (♂ ad.): total length 235; tail vertebrae 79; hind foot 30. Average of 7 adults from type locality: total length 222; tail vertebrae 78; hind foot 30.

***Thomomys aureus pervagus* subsp. nov.**

*Type* from Espanola, New Mexico. No. 58,293, ♂ ad., U. S. National Museum, Biological Survey Collection. January 4, 1894. J. Alden Loring. Original No. 1548.

*Characters*.—Similar to *aureus* but much darker, color chestnut fulvous instead of golden fulvous; upperparts dull chestnut fulvous, the middle part of back broadly mixed with black-tipped hairs; nose and



sides of mouth dusky; chin white; underparts salmon. Nasals broader posteriorly than in *aureus*.

*Measurements*.—Type specimen (♂ ad.): total length 244; tail vertebrae 76; hind foot 31. Average of 2 males from type locality: total length 245; tail vertebrae 73; hind foot 32.

***Thomomys aureus perpes* subsp. nov.**

*Type* from Lone Pine, Owens Valley, California. No.  $\frac{339\frac{1}{2}}{28\frac{1}{2}}$ , ♂ ad., U. S. National Museum, Biological Survey Collection. December 23, 1890. E. W. Nelson. Original No. 145.

*Characters*.—Size rather small; color buffy gray, in summer becoming more buffy fulvous.

*Color*.—Upperparts buffy gray, darkest on head and nose, palest and with strongest buffy suffusion on sides; underparts, feet, and tail buffy whitish. Summer specimens are more buffy fulvous like *aureus*.

*Cranial characters*.—Skull similar in general to the smaller specimens of *aureus*, but decidedly shorter and with much smaller bullae.

*Measurements*.—Type specimen (♂ ad.): total length 215; tail vertebrae 65; hind foot 28. Average of 10 adults from type locality: total length 212; tail vertebrae 66; hind foot 28.5.

***Thomomys angularis pascalis* subsp. nov.**

*Type* from Fresno, San Joaquin Valley, California. No.  $\frac{377\frac{1}{2}}{50\frac{1}{2}}$ , ♂ ad., U. S. National Museum, Biological Survey Collection. May 4, 1892. C. P. Streater. Original No. 1634.

*Characters*.—Similar to *angularis* but smaller; upperparts less fulvous (more buffy yellowish); underparts very much paler and often marbled irregularly with patches of white; wrists and ankles usually white; ears smaller and dusky; earpatch obsolete or nearly so. Skull smaller and smoother; the temporal ridges not uniting to form a sagittal crest; interorbital constriction less marked; bullae larger; angle of under jaw smaller.

*Measurements*.—Type specimen (♂ ad.): total length 236; tail vertebrae 80; hind foot 32. Average of 4 males from type locality: total length 212.5; tail vertebrae 71.5; hind foot 30.5. Average of 4 females from type locality: total length 195; tail vertebrae 63; hind foot 28.

***Thomomys fuscus fisheri* subsp. nov.**

*Type* from Beckwith, Sierra Valley, Plumas County, California. No. 101,238, ♂ ad., U. S. National Museum, Biological Survey Collection. August 3, 1900. Walter K. Fisher. Original No. 1547.

*Characters*.—Similar to *fuscus* but upperparts very much paler; grayish brown instead of dull fulvous brown.

*Cranial characters*.—Skull similar to that of *fuscus* but shorter; zygo-

mata more squarely spreading; premaxillæ shorter and broader posteriorly; bullæ less swollen; incisors narrower.

*Measurements*.—Type specimen (♂ ad.): total length 191; tail vertebræ 62; hind foot 25. Average of 6 specimens from type locality: total length 192; tail vertebræ 58; hind foot 25.

***Thomomys myops* sp. nov.**

*Type* from Conconully, east base Cascade Range, State of Washington. No. 91,066, ♀ ad., U. S. National Museum, Biological Survey Collection. September 11, 1897. J. Alden Loring. Original No. 4650.

*Characters*.—Size small; color and external characters generally as in *T. fuscus*; skull peculiar.

*Color*.—Upperparts dull pale rufous brown; underparts buffy ochraceous, the dark slate underfur showing through; throat, chin, and feet whitish; nose, sides of mouth, ring round eye, and earpatch dull plumbeous, the earpatch darkest.

*Cranial characters*.—Skull in general similar to that of *quadratus*, but zygomata less quadrate and posterior root shorter; nasals broader, truncate posteriorly, and ending on same plane as premaxillæ, which are remarkably short and truncate posteriorly; bullæ about as in *quadratus*—less swollen than in *fuscus*; under jaw rather massive, about as in *quadratus*—decidedly heavier than in *fuscus*.

*Measurements*.—Type specimen (♀ ad.): total length 197; tail vertebræ 63; hind foot 26. Average of 7 specimens from type locality: total length 184; tail vertebræ 58; hind foot 24.5.

***Thomomys leucodon navus* subsp. nov.**

*Type* from Red Bluff, California. No. 57,791, ♂ ad., U. S. National Museum, Biological Survey Collection. December 26, 1893. C. P. Streater. Original No. 3462.

*Characters*.—Similar to *leucodon* but much smaller; incisors projecting forward, their faces yellow instead of white; upperparts paler and brighter fulvous; underparts buffy ochraceous instead of fulvous.

*Cranial characters*.—Skull small but very strong and ivory-like in texture; zygomata broadly spreading, broadest posteriorly; nasals cuneate, usually notched behind.

*Measurements*.—Type specimen (♂ ad.): total length 200; tail vertebræ 67; hind foot 27. Average of 8 specimens from type locality: total length 196; tail vertebræ 65; hind foot 27.

***Thomomys uinta* sp. nov.**

*Type* from Uinta Mountains, Utah. Altitude 10,000 feet. No. 111111, ♂ ad., U. S. National Museum, Biological Survey Collection. June 6, 1890. Vernon Bailey. Original No. 1262.

*Characters*.—Size medium; coloration dark; nose, chin and region around mouth blackish; earpatch black; fore feet and legs dark. Skull long; nasals short.

*Color*.—Upperparts dull grayish brown with a dull fulvous suffusion and 'pepper and salt' appearance from profuse admixture of black tipped hairs; cheeks and sides of neck grizzled bister; sides grayish or grayish brown; nose, earpatch, and throat dusky; fore legs and feet grayish dusky with a little white at base of toes; hind feet whitish; tail mainly dark above.

*Cranial characters*.—Skull rather small but larger than that of *fuscus*; zygomata moderately spreading; broadest behind; nasals short, falling far short of premaxillae, and moderately or faintly notched behind; interparietal large, pentagonal or between subquadrate and pentagonal; temporal impressions nearly parallel but not forming ridges as in *talpoides* and *bridgeri*; auditory tubes conspicuous; bullae and teeth rather large.

*Remarks*.—This species is so distinct that close comparison with others is unnecessary. The skull may be told at a glance by the very short nasals and relatively long premaxillae in connection with the size and shape of the interparietal.

*Measurements*.—Type specimen: total length 220; tail vertebrae 68; hind foot 30. Average of 2 males from type locality: total length 226; tail vertebrae 70.5; hind foot 31. An adult female from type locality: total length 211; tail vertebrae 64; hind foot 28.

### *Thomomys bridgeri* sp. nov.

*Type* from Fort Bridger, Wyoming. No.  $\frac{144}{102}$ , ♂ ad., U. S. National Museum, Biological Survey Collection. May 27, 1890. Vernon Bailey. Original No. 1207.

*Characters*.—Rather large. Size and proportions as in *talpoides* but ears having a distinct point posteriorly; coloration dark (similar to *fuscus*, darker and redder than *talpoides*); differs from both *talpoides* and *fuscus* in having chin and openings of cheek pouches black instead of white.

*Color*.—Upperparts usually pale dull chestnut brown, sometimes almost buffy brown, and always well mixed with black hairs; underparts strongly washed with buffy fulvous; nose, earpatch, chin, and openings of cheek pouches dusky; feet whitish.

*Cranial characters*.—Skull rather large, with marked parallel temporal ridges, long rostrum and nasals (nasals deeply notched behind and squarish spreading zygomata. Similar in general to *talpoides*, but rostrum and nasals much longer; nasals deeply notched behind; auditory tube strongly ossified and widely protruding. Compared with *T. umta*, whose range it joins, it differs strikingly in the great length of the nasals, broadly spreading zygomata, smaller and differently shaped interparietal, much more strongly developed temporal ridges, and decidedly larger size.

*Measurements*.—Type specimen (♂ ad.): total length 237; tail vertebrae 71; hind foot 34. Average of 8 adults from type locality: total length 228; tail vertebrae 69; hind foot 31.5.

***Thomomys clusius oculus* sp. nov.**

*Type* from Fort Bridger, Wyoming. No.  $\frac{14444}{25111}$ , ♂ ad., U. S. National Museum, Biological Survey Collection. May 24, 1890. Vernon Bailey. Original No. 1194.

*Characters*.—Similar to *clusius* but slightly smaller and much paler, the upperparts pale buffy; sides of nose and region around mouth dusky plumbeous; cheeks pale buffy gray; sides whitish, tinged with buffy; feet and underparts white.

*Cranial characters*.—Skull like that of *clusius* but zygomata less spreading; temporal ridges a little more strongly developed; interparietal larger; bullae decidedly larger.

*Measurements*.—Type specimen: total length 204; tail vertebrae 60; hind foot 26. Average of 8 adults from type locality: total length 197; tail vertebrae 57; hind foot 25.

***Thomomys idahoensis* sp. nov.**

*Type* from Birch Creek, Idaho. No.  $\frac{23482}{30906}$ , ♂ ad., U. S. National Museum, Biological Survey Collection. August 8, 1890. C. P. Streater. Original No. 129.

*Characters*.—Size small; coloration pale. Similar in general to *clusius* but much smaller and paler.

*Color*.—Upperparts grayish buff strongly washed with buffy fulvous, often with 'pepper and salt' appearance; underparts, tail, and feet buffy white.

*Cranial characters*.—Skull small and rather light, with enormous bullae and narrow zygomata. In general like *clusius* but much smaller; bullae much larger and more swollen; nasals long and rather slender, with straight sides.

*Measurements*.—Type specimen: total length 170; tail vertebrae 47; hind foot 23. Average of 10 specimens from type locality: total length 172; tail vertebrae 51; hind foot 22.5.

***Thomomys desertorum* sp. nov.**

*Type* from Mud Spring, Detrital Valley, Arizona. No.  $\frac{3811}{4811}$ , ♂ ad., Merriam Collection. February 21, 1889. Vernon Bailey. Original No. 598.

*Characters*.—Size small; coloration buffy or golden fulvous, much as in *aureus*. Does not require comparison with any known species.

*Color*.—Upperparts (including tail) bright ochraceous, varying from buffy fulvous to bright orange fulvous; dark nose patch usually reaching up to between eyes and often to between ears; underparts varying from buffy to salmon fulvous; chin usually dusky; feet whitish; ear-patch dark.

*Cranial characters*.—Skull very small, much smaller than *fulvus*; zygomata strongly bowed outward—the anterior angle marked; interparietal subquadrate, broader than long; nasals notched at hinder end, not reaching near ends of premaxillae; bullae large and swollen.

***Thomomys pygmæus* sp. nov.**

*Type* from Montpelier Creek, Idaho (alt. 6700 ft.). No. 55,271, ♂ ad., U. S. National Museum, Biological Survey Collection. July 29, 1893. Vernon Bailey. Original No. 4150.

*Characters*.—Size smallest of the known species; feet very small; color dark; skull sub-cylindrical.

*Color*.—Upperparts dark rufus brown; underparts buffy fulvous, the dark underfur showing through; nose dusky; feet whitish.

*Cranial characters*.—Skull similar in general to that of *idahoensis* but much smaller; braincase more cylindrical; interparietal larger and transversely oval; nasals short, rather broad and emarginate at posterior end; bullae strikingly smaller; teeth large—relatively larger than in *idahoensis*.

*Measurements*.—Type specimen (♂ ad.): total length 177; tail vertebrae 46; hind foot 22. Another male from type locality: total length 165; tail vertebrae 40; hind foot 20.

***Thomomys douglasi oregonus* subsp. nov.**

*Type* from Oregon City, Willamette Valley, Oregon. No. 56,939, ♂ ad., U. S. National Museum, Biological Survey Collection. October 24, 1893. C. P. Streater. Original No. 3340.

*Characters*.—Externally like *douglasi*, but usually lacking the white spot on breast.

*Cranial characters*.—Compared with *douglasi* the zygomata are larger and much more broadly bowed outward and rounded, the outer sides parallel instead of diverging anteriorly; nasals narrower posteriorly but sides straight as in *douglasi*; interparietal decidedly larger and longer anteriorly, subtriangular instead of transversely oval, with posterior margin straight and not encroaching on supraoccipital; bullae more swollen; pterygoid notch V-shaped instead of U-shaped.

*Measurements*.—Type specimen (♂ ad.): total length 220; tail vertebrae 70; hind foot 30. Average of 10 adults from type locality: total length 213; tail vertebrae 66.5; hind foot 29.

***Thomomys limosus* sp. nov.**

*Type* from White Salmon, Gorge of the Columbia, Washington. No. 80,724, ♂ ad., U. S. National Museum, Biological Survey Collection. June 26, 1897. J. Alden Loring. Original No. 4382.

*Characters*.—Similar in size and proportions to *douglasi* but color much darker; cranial characters distinctive.

*Color*.—Upperparts dark umber brown; underparts dark slate, the tips more or less deeply washed with buffy or buffy fulvous; feet and tail whitish.

*Cranial characters*.—Compared with typical *douglasi* from Fort Vancouver, the zygomatics are much more broadly bowed outward and less angular, the nasals slightly constricted behind anterior third and somewhat expanded and emarginate at posterior end, giving them a 'fish-tail' form; interpterygoid space V-shaped instead of U-shaped; angular process of under jaw decidedly larger and more spreading.

*Measurements*.—Type specimen: total length 224; tail vertebrae 68; hind foot 30. Average of 4 adults from type locality: total length 219; tail vertebrae 68; hind foot 29.

***Thomomys hesperus* sp. nov.**

*Type* from Tillamook, Oregon. No. 69,825, ♀ ad., U. S. National Museum, Biological Survey Collection. November 9, 1894. J. E. McLellan. Original No. 1189.

*Characters*.—Size small; feet very small (hind foot with claws 24); tail short; ears small; color deep rufous.

*Color*.—Upperparts deep rufous; nose, earpatch, and ring round eye dusky; underparts varying from buffy fulvous to salmon fulvous; tail dark above, at least on basal half, whitish below and at tip all round; fore and hind feet whitish.

*Cranial characters*.—Skull small and light; interparietal large and broadly sub-triangular; bullae small and rounded, short anteriorly; incisors narrow.

*Remarks*.—This species differs so markedly from its nearest allies that close comparison is unnecessary. From *T. melanops* Merriam from the Olympic Mountains, which appears to be its nearest relative, it differs in much smaller size, strikingly smaller feet and skull; very much narrower incisors; smaller, shorter, and more rounded bullae; smaller and narrower basioccipital, much shorter rostrum and nasals, shorter tail, and more rufous coloration.

*Measurements*.—Type specimen (♀ ad.): total length 175; tail vertebrae 54; hind foot 24. Average of 3 females from type locality: total length 179; tail vertebrae 51.5; hind foot 24.

**Thomomys niger** sp. nov.

*Type* from Seaton, near mouth of Umpqua River, Oregon. No. 69,407, ♂ ad., U. S. National Museum, Biological Survey Collection. October 6, 1894. J. E. McLellan. Original No. 1147.

*Characters*.—Size medium; feet large; tail medium; ears short; head and body all round *glossy slate black* with greenish iridescence; nose duller, feet and tail white, sometimes irregularly blotched with dusky.

*Cranial characters*.—Skull of medium size, massive, showing well developed temporal ridges; interparietal oval or broadly subtriangular; zygomatica moderately spreading and rounded; nasals emarginate, strongly and abruptly narrowed on posterior two-thirds.

*Remarks*.—In coloration the 6 specimens at hand from the type locality strikingly resemble *T. orizabæ* from southern Mexico. They differ from *orizabæ* in having less black on the feet and tail, and in marked cranial characters. The nearest relative of *T. niger* appears to be *T. douglasi* from the Columbia River. It differs from *douglasi*, apart from color, in slightly smaller size and in the following cranial characters: frontals narrower interorbitally; zygomatica rounded instead of angular, their outer sides parallel instead of diverging anteriorly; nasals abruptly constricted between anterior and middle thirds and narrower posteriorly (instead of having straight sides); bullæ heavier anteriorly; molar series of same length as in *douglasi* but broader; incisors strikingly large and broad; underjaw deep, the angular process much more heavily developed.

*Measurements*.—Type specimen (♂ ad.): total length 225; tail vertebræ 81; hind foot 30. Average of 5 adults from type locality: total length 215; tail vertebræ 72; hind foot 30.





PROCEEDINGS  
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DESCRIPTIONS OF FOUR NEW PECCARIES  
FROM MEXICO.

BY C. HART MERRIAM.

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A preliminary study of the Mexican Peccaries in the collection of the Biological Survey of the U. S. Department of Agriculture, shows that the Collared Peccary (*Tayassu angulatus*) is separable into several strongly marked subspecies, that a very distinct dwarf species of the same group inhabits Cozumel Island off the coast of Yucatan, and that the large South American White-lipped Peccary (*albirostris*\* Illiger-*labiatus* Cuvier), not previously known from Mexico, is represented in the State of Campeche by a strongly marked subspecies of which four specimens were recently collected by E. W. Nelson and E. A. Goldman.

The American Peccaries comprise two very distinct super-specific or subgeneric types, which may be designated as (a) the

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\**Sus albirostris* Illiger (1815) antedates by two years *Dicotyles labiatus* Cuvier (1817) and is therefore, so far as known, the earliest specific name for the White-lipped Peccary. Illiger's original reference is as follows: "The two species of swine or peccaries peculiar to South America, the *Sus Tayassu* and the *Tagnicati* (*Sus albirostris*) distinguished for the first time by Azara, must form a special group within the genus. They have hardly any tail and only one claw on the hind feet" (p. 115).—Illiger, Abhand. K. Akad. Wiss. Berlin (1811), pp. 106, 115, 1815.

*tajacu* group, and (b) the *albirostris* group. In both groups the male is larger than the female and has larger teeth. In some forms the sexual disparity in size is small; in others it is great.

The Peccaries of the *tajacu* group inhabiting Mexico and the United States appear to break up into 6 forms, as follows:

*Tayassu angulatus* (Cope) Texas and northeastern Mexico.

*angulatus sonoriensis* (Méarns). Southern Arizona and Sonora.

*angulatus humeralis* nob. Colima to Tehuantepec.

*angulatus crassus* nob. Metlaltoyuca, Puebla (and Huehuetan, Chiapas).

*angulatus yucatanensis* nob. Yucatan.

*nanus* Merriam.\* (A dwarf insular species) Cozumel Island.

In comparing skulls of the *tajacu-angulatus* series with those of the *albirostris* series, such striking and important differences appear that it seems necessary to recognize the two groups as constituting separate subgenera. Indeed J. E. Gray, in 1868, separated them as full genera, restricting Cuvier's generic name *Dicotyles* to *labiatus* (= *albirostris*) and adopting Fischer's name *Notophorus* for the Collared Peccary. (Proc. Zool. Soc. London, 1868, pp. 21, 43-45.)

But these names (*Dicotyles* and *Notophorus*, both proposed in 1817) are pure synonyms of *Tayassu* 1814, and cannot therefore be restricted to either of the two original species, both having been included by Fischer in the original diagnosis of his genus *Tayassu*. This leaves the *albirostris* group without a name. To supply the deficiency I propose to call it *Olidosus*.

Subgenus **Olidosus**† nob.

*External characters.*—Size large; setæ over posterior part of eyes very large and long, reaching back nearly to tip of ears; occiput and neck bearing a mane of long flat black bristles which in passing backward become greatly elongated (lose their points and become frayed at tips), spread out laterally overlying the short annulated bristles of sides of

\*See *antea*, p. 102.

†*Olidos*, stinking; *sus*, hog.

back, and cover the entire rump, where, when old, they develop swollen whitish nodes or joints giving the rump a very curious appearance.\*

*Cranial characters.*—Skull large, heavy, and massive; upper surface of rostrum and nasals broadly flattened or only slightly convex; nasals acute anteriorly, reaching almost as far forward as premaxillæ; zygomatic ridge rising abruptly to top of skull and disappearing anteriorly over 2d premolar; anterior opening of antorbital foramen situated over posterior root of 1st molar; *sides of rostrum broadly flattened* (swollen instead of excavated over premolars, and not divided into upper and lower parts by continuation of zygomatic ridge); *palate very broad and flat*, expanded instead of narrowed between canines and molars, and lacking the sharp ridge which in the *angulatus* group runs from 1st premolar to inner side of canine; angle of underjaw rounded below anteriorly.

*Dental characters.*—Teeth large and heavy, relatively broad anteriorly; 2d lower molar with posterior cusp nearly as large and high as anterior (thus differing widely from its condition in *angulatus*, in which the tooth is not only very much smaller, but the anterior cusp is high and slender, the posterior nearly obsolete); incisors and canines only slightly larger than in *angulatus*; molariform teeth much larger (relative increase in size greatest in 1st and 2d lower premolars).

***Tayassu albirostris ringens* subsp. nov.**

*Type* from Apazote, near Yohaltun, Campeche. No. 108,279. ♀ ad., U. S. National Museum, Biological Survey Collection. January 1, 1901. E. W. Nelson and E. A. Goldman. Original No. 11,383.

*Character.*—Size large (length nearly 4 feet); ears small; color nearly black; muzzle white; rump and median part of back clothed with exceedingly long and flexible flattened bristles, frayed at the ends, those on posterior part of back (when old) with terminal third or half marked by distinct joints or nodes (those on rump averaging three or four on each bristle). Similar in general characters to *albirostris*, from which it differs in the much greater extension of the whitish face markings, the white covering the muzzle completely from snout to midway between nose and eyes, and extending backward along sides of underjaw to below ears, and in the presence of an ill defined white band above hoofs of hind feet.

*Color.*—Upperparts black, on close inspection sparingly grizzled with fulvous, especially on sides of neck and shoulders; top of head from occiput to midway between eyes and nose black; muzzle chin and lips

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\*Under the microscope the nodes are found to mark points where the horny longitudinal fibers of the outer coat have begun to break and spread. Transverse sections at these points, made by my assistant Dr. S. D. Judd, show that complete disintegration of the interior radiating pith or core has taken place, and indicate that the nodes are confined to the dead terminal parts of the bristles.

pale yellowish white, the whitish color of chin extending back broadly on each side of underjaw to below ears, forming a very conspicuous broad V-shaped marking; underparts sparsely haired, black, grizzled with fulvous; legs and feet blackish, mixed with soiled white near hoofs; the whitish in hind feet forming an indistinct band above hoofs.

*Cranial characters.*—The skull of the type specimen, a fine adult female, compared with a skull of the same size from San Lorenzo, Rio Grande, Brazil, received through the courtesy of Professor Hermann von Ihering, presents the following differences: parietal shield narrower, elevated and strongly bulging upward over posterior part of braincase; nasals more acute anteriorly, the free end appearing longer; premaxillæ slightly longer; zygomata and posterior expansion of squamosals decidedly broader; posterior part of palate quite different, the projection behind molars abruptly narrowed at post molar notch (behind on inner side of molar alveolus) and continuing backward with smooth parallel sides of essentially equal breadth throughout, while in *albirostris* it is much broader anteriorly and slopes irregularly backward; bullæ smaller and ending below in an elongated papilla pointing toward hamular process; basi-occipital considerably narrower between bullæ posteriorly.

*Measurements.*—Type specimen (♀ ad.): total length in dry skin 1180; hind foot in flesh 229. *Skull:* basal length 242; basilar length of Hensel 231; occipitonasal length 270; zygomatic breadth 112; greatest breadth across squamosals posteriorly 106; palatal length 184; breadth of posterior extension of palate midway between molars and hamulars 16; breadth of basioccipital between bullæ posteriorly 20; length of upper molariform series 78.

• Subgenus **Tayassu** Fischer.

(Here restricted to the *tajuru-angulatus* group).

**Tayassu angulatus humeralis** subsp. nov.

*Type* from Armeria, Colima. No. 45,243, ♀ ad., U. S. National Museum, Biological Survey Collection. February 26, 1892. E. W. Nelson and E. A. Goldman. Original No. 1945.

*Characters.*—Similar to *angulatus* but sides grayer; head yellower; dorsal black band more strongly marked, almost as sharply as in *sonoriensis* from Arizona; shoulder stripes yellowish ochraceous, broad and conspicuous, as strongly marked as in *yucatanensis* but yellowish fulvous instead of white. Skull of male similar to that of male *angulatus*; skull of female decidedly larger with longer tooth row. In skulls young enough to show the sutures the nasal bones are strongly convex posteriorly, long and slender, and only slightly broader between maxillæ than between premaxillæ (differing markedly from their condition in *angulatus*, in which they are very much broader between the maxillæ); and the ascending or nasal arm of premaxilla is decidedly longer than in *angulatus*.

*Remarks.*—Compared with *sonoriensis* of Arizona the sides are less gray, the dorsal band less sharply defined, the shoulder stripes yellower and much more strongly marked. The sexual disparity in size is greater than in *sonoriensis*, the female being considerably larger than the male.

*Measurements.*—Type (♀ ad.): total length 960; tail 60; hind foot 215. *Skull:* basal length 203; occipitonasal length 224; zygomatic breadth 108; greatest breadth across squamosals posteriorly 90; palatal length 151; length of upper molariform series 67.

***Tayassu angulatus yucatanensis* subsp. nov.**

*Type* from Tunkas, Yucatan. No. 108,282, ♂ yg-ad., U. S. National Museum, Biological Survey Collection. February 12, 1901. E. W. Nelson and E. A. Goldman. Original No. 14,534.

*Characters.*—Sexes nearly alike, the female not noticeably larger than the male. Size and general characters much as in *angulatus* but sides decidedly whiter; shoulder stripes broader, much more conspicuous, and somewhat subtriangular, broadest where they abut against the median dorsal black band which is well developed; (shoulder stripes broadest and most striking in young;) pelage coarser and scantier, the individual bristles decidedly larger and fewer in number; no black on nose or underlip. Skull similar to that of *angulatus* but nasals acute and rather short anteriorly, exposing more than usual of the floor of the anterior nares (upper surface of premaxillæ); posterolateral upward extension of squamosal (above and in front of auditory meatus) decidedly shorter than in *angulatus*, molariform teeth smaller and narrower—particularly the lower molars; in skulls young enough to show the sutures the nasals are short and very narrow between premaxillæ and expanded in the middle—very different from either *angulatus* or *humeralis*; they are more like those of *nanus*, but more contracted anteriorly.

*Remarks.*—Specimens from Tunkas and Chichen Itza in the arid peninsula of Yucatan are typical of this form, but specimens from the humid east coast strip are by no means typical and appear to represent a tropical form which here reaches its northern limit. Thus an adult male from LaVega (No. 108,514\*) is larger and has coarser pelage than those from the arid interior, and differs considerably in color, the light rings on the bristles being yellowish fulvous instead of white, and the underlip blackish.

*Measurements.*—Type (♂ yg-ad.): total length 880; tail 36; hind foot 183. Average of 2 males from type locality: total length 887; tail 36; hind foot 182.5. Average of 3 females from type locality: total length 896; tail 36; hind foot 181.

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\*The measurements of this specimen are: total length 945; tail 34; hind foot 202.

***Tayassu angulatus crassus* subsp. nov.**

*Type* from Metlatoyuca, Puebla. No. 92,960, ♂ yg-ad., U. S. National Museum, Biological Survey Collection. February 1, 1898. E. W. Nelson and E. A. Goldman. Original No. 12,127.

*Characters*.—Similar in general to *angulatus* but larger; pelage very much coarser, the individual bristles exceedingly large and rigid; black dorsal stripe illdefined or obsolete; general color grizzled gray, much paler than *angulatus*; hind legs grizzled black and fulvous; skull longer; molariform teeth narrower; anterior opening of antorbital foramen between 2d and 3d premolars (instead of between 3d premolar and 1st molar as in *angulatus*). Front of underjaw (seen from below) narrower, flatter, and less swollen in front of forks of rami. Crown of 1st upper premolar narrower and more slender; crown of last lower molar longer and narrower.

*Remarks*.—Only two specimens from the type locality, both young adult males, are in the collection. The skulls resemble two from Huehuetan, Chiapas, of which both sexes are at hand. In the Huehuetan animal the skull of the female is decidedly larger than the male—being longer, and broader across the rostrum. The skins are quite different, those from Huehuetan being darker, the black dorsal stripe present anteriorly (from occiput to shoulders); rump and hind legs blacker; nose blackish; light rings on bristles on anterior part of body (particularly on head) ochraceous or yellowish fulvous instead of whitish, giving a very different color to the head; bristles larger—largest of all.

*Measurements*.—Type (♂ yg-ad.): total length 950; tail 54; hind foot 203.

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TWO NEW RODENTS FROM NORTHWESTERN  
CALIFORNIA.

BY C. HART MERRIAM.

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***Phenacomys albipes* sp. nov.**

*Type* from Redwoods, near Arcata, Humboldt Bay, California. No. 97,236, ♂ ad., U. S. National Museum, Biological Survey Collection. May 24, 1899. Walter K. Fisher. Original No. 821.

*Characters*.—Appearance *Microtus*-like; size rather large; tail long, sharply bicolor, and scantily haired. Color grizzled brown; fore and hind feet white.

*Color*.—Upperparts grizzled bistre with brownish wash on head, shoulders, and sides; sides of nose dark grayish; underparts grayish plumbeous with buffy wash; fore and hind feet white; ankles dusky; tail dusky above and broadly whitish below, with sharp line of demarcation.

*Cranial characters*.—Skull long and rather slender; braincase long; interparietal large and broad, zygomata not spreading, the anterior roots sloping strongly backward, the jugals slightly expanded and nearly parallel; nasals broadly wedge-shaped, truncate posteriorly in front of premaxilla, incisive foramina rather short and broad; bullae large; interpterygoid fossa long, squarely truncate anteriorly against a broad median azygos projection of the palate.

*Remarks*.—The only species with which *P. albipes* requires comparison is *P. longicaudus* True from western Oregon—one of the rarest and least known mammals of the world. So far as I am aware only two specimens of *longicaudus* have been collected—the type and a female in the Biological Survey Collection, from Meadows, Lane County, Oregon.

Both were obtained by Aurelius Todd. The type specimen is a woolly fulvous animal with a large hairy blackish tail and dark fore and hind feet. The other specimen is pale buffy fulvous and seems to be a partial albino. Compared with the type of *P. longicaudus*, *P. albipes* differs strikingly, the body being coarsely grizzled brownish bister, like an ordinary field mouse (*Microtus*), instead of fulvous, the feet white instead of dark brown, the tail slender, scantily haired, and white underneath, instead of large, hairy and blackish all round.

The skull of the type of *longicaudus* is reduced to fragments but the parts that remain agree essentially with corresponding parts of the skull from Meadows, Lane County, Oregon (No. 42,621 ♀). Compared with the latter the skull of *albipes* differs markedly in greater length and narrowness, less spreading zygomata, narrower and longer braincase, longer rostrum and nasals, larger bullae, and longer interpterygoid fossa, which is square anteriorly instead of rounded or angular.

*Measurements*.—Type specimen (♂ ad.): total length 168; tail vertebrae 62; hind foot 19.

***Callospermophilus chrysodeirus trinitatis* subsp. nov.**

*Type* from Trinity Mountains east of Hoopa Valley, California (altitude 5700 feet). No. 95,531, ♀ ad. U. S. National Museum, Biological Survey Collection. September 10, 1898. Vernon Bailey. Original No. 6693.

*Characters*.—Size large; ground color dark; under side of tail dark chestnut. In fall pelage similar to *chrysodeirus*, but larger; ground color darker; inside of tail dark chestnut (instead of golden fulvous); skull and teeth larger; nasals longer.

*Remarks*.—This spermophile, which is common in the Siskiyou, Salmon, and Trinity Mountains of northwestern California and southwestern Oregon, is much larger and darker than *chrysodeirus*, and never, so far as known, develops the golden mantle which covers the head and shoulders of that species. In size it equals *naturatus* of the Cascade Range in the State of Washington, but differs widely from that species in having the inner black stripe strongly developed (as in *chrysodeirus*), and the under side of the tail solid chestnut instead of grizzled fulvous.

*Measurements*.—Type specimen (♀ ad.): total length 290; tail vertebrae 105; hind foot 44. Average of 6 specimens from type locality: total length 283; tail vertebrae 100; hind foot 43.



PROCEEDINGS  
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DESCRIPTIONS OF THREE NEW KANGAROO MICE  
OF THE GENUS *MICRODIPODOPS*.

BY C. HART MERRIAM.

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Since the discovery of the genus *Microdipodops*\* in East Humboldt Valley, Nevada, in 1891, by Vernon Bailey, the explorations of the U. S. Biological Survey in adjacent territory have resulted in not only extending the range of the original species (*megacephalus*) but also in the discovery of three additional forms, two of which appear to merit full specific rank. These are here described.

***Microdipodops megacephalus oregonus* subsp. nov.**

*Type* from Lake Alvord, Alvord Desert, eastern Oregon. No. 80,128, ♂ yg-ad., U. S. National Museum, Biological Survey Collection. August 18, 1896. C. P. Streater. Original No. 5430.

*Characters*.—Similar to *megacephalus* but tail longer; pelage less fluffy, upperparts more olivaceous and less conspicuously lined with black-tipped hairs; underparts white—buffy wash less marked; a whitish streak usually present along under side of tail; skull smaller.

*Measurements*.—Type specimen (♂ yg-ad.): total length 153; tail vertebrae 88; hind foot 24.

***Microdipodops pallidus* sp. nov.**

*Type* from 10 miles east of Stillwater, near Sink of the Humboldt and Carson, Churchill County, Nevada. No. 93,520, ♀ ad., U. S. National

Museum, Biological Survey Collection. May 11, 1898. H. C. Oberholser. Original No. 101.

*Characters.*—Size slightly larger than *megacephalus*; pelage long, soft, lax and fluffy; tail *decidedly longer and without dark tip*; body much paler.

*Color.*—Upperparts pale buffy fulvous, finely and inconspicuously lined with dark-tipped hairs; underparts, including sides of nose, lower sides of face, legs, feet, and underside of tail white; upperside of tail buffy throughout without dark tip.

*Cranial characters.*—Skull essentially as in *megacephalus*.

*Measurements.*—Type specimen (♀ ad.): total length 171; tail vertebrae 102; hind foot 25.5.

#### ***Microdipodops californicus* sp. nov.**

*Type* from Sierra Valley, near Vinton, Plumas County, California. No. 101,227, ♂ yg-ad., U. S. National Museum, Biological Survey Collection. August 7, 1900. Walter K. Fisher. Original No. 1596.

*Characters.*—Size of *megacephalus*; tail and hind foot longer; pelage more compact and less fluffy than in the other species; color olivaceous underparts and head markings *snow white*.

*Color.*—Upperparts olivaceous, finely and inconspicuously lined with dark-tipped hairs; underparts, feet, sides of nose, spot over eye, patch behind ear, and mark on upper and lower folds of ear, snow white; tail above pale buffy fulvous becoming blackish toward tip; below white throughout; side of face below body-color, and outer side of foreleg, washed with pale buffy fulvous.

*Cranial characters.*—Skull as a whole similar to that of *megacephalus* but decidedly smaller, due chiefly to smaller size of audital capsules, the skull proper being about the same size; notch between bulging bullae posteriorly broader; nasals decidedly more slender.

*Measurements.*—Type specimen (♂ yg-ad.): total length 158; tail vertebrae 91; hind foot 25. Average of 10 from type locality: total length 160; tail vertebrae 92; hind foot 25.

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\*North America Fauna No. 5, pp. 115-117, August, 1891.

PROCEEDINGS  
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A NEW SPECIES OF GALICTIS FROM MEXICO.

BY E. W. NELSON.

***Galictis canaster*** new species. Yucatan Grison.

*Distribution*.—Known only from Tunkas, northern Yucatan, Mexico.

*Specific characters*.—Face and entire underparts including feet and legs black; black area of face limited posteriorly by a well defined pure white stripe extending across forehead above eyes and reaching back across each cheek, covering front of ears, and thence along sides of neck becoming obsolete near shoulders; rest of upper side of head shading gradually back from the pure white stripe into the general smoky gray of upperparts, including tail; underfur on upperparts light gray; long hairs same color at base with broad subterminal black bands and white tips. The black bands on the long hairs produce the effect of a thin dark wash over the pale under color.

*Size and proportions*.—Total length (estimated) between 650 and 700 millimeters. A powerfully built, short legged, heavy bodied animal with short round ears like *Galictis vittata*, but exceeding it in size.

*Remarks*.—The species described above is closely related to *Galictis vittata*, agreeing with it generally in proportions and in the characteristic pattern of coloration. The most striking difference between the two animals is in the color of the upperparts. The hairs on the back of *Galictis vittata* from Guiana and Brazil are described as being dark brown or yellowish gray with white or yellowish tips. *Galictis canaster* has the underfur and basal half of the long hairs of the back light gray, the long hairs have broad subterminal bands of black and small white tips.

The northernmost references I have been able to find for *Galictis vittata* (the only species commonly recognized in the restricted genus *Galictis*)

are Guiana and northern Brazil. The capture of a member of the group in Yucatan adds greatly to its known range and no doubt indicates that it is represented, although hitherto overlooked, in much of the intervening region.

The interesting animal upon which the present description is based was captured alive by the Indians near Tunkas, Yucatan, and sent to General Canton, Governor of the State. While in Merida, Yucatan, I heard of a strange animal in the Governor's possession and upon making known my desire to see it was courteously invited to visit his house for the purpose. There I found the animal living in a cage and made the accompanying description of its size and color. Later, while working at Tunkas, the Indians told me of its capture and said it was extremely rare. They called it '*El Rey de las Ardillas*,' or king of the squirrels, but it appeared to have been previously unknown to nearly everyone with whom I talked.

PROCEEDINGS  
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DESCRIPTIONS OF TWO NEW SQUIRRELS  
FROM MEXICO.

BY E. W. NELSON.

***Sciurus yucatanensis balliolus*\*** new subspecies. Campeche Squirrel.

*Type* No. 107,939, ♂ ad., U. S. National Museum, Biological Survey Collection, from Apazote, Campeche, Mexico, collected January 8, 1901, by E. A. Goldman.

*Distribution*.—Southern Campeche and eastern Tabasco (north of the Usumacinta River) Mexico.

*Subspecific characters*.—Differs from typical *Sciurus yucatanensis* from northern Yucatan in much darker color above and below. Upperparts dark blackish gray with a dull buffy suffusion; outside of fore feet and legs black, finely grizzled with dull buffy or gray; top of hind feet black; underparts dark iron gray; tail black thinly washed with gray.

*Skull*.—Practically same as in typical form.

*Dimensions of type*.—Total length 464; tail vertebrae 238; hind foot 59.

*Remarks*.—Typical *S. yucatanensis* lives in the arid region of northern Yucatan and Campeche while the present subspecies inhabits the much more humid forests of southern Campeche and adjacent border of Tabasco and will doubtless be found also in southern Yucatan where similar climatic conditions prevail.

***Sciurus deppei vivax*†** new subspecies. Zapote Squirrel.

*Type* No. 107,932, ♀ ad., U. S. National Museum, Biological Survey Collection, from Apazote, Campeche, Mexico. Collected January 8, 1901, by E. A. Goldman.

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\**Baliolus*=dark, swarthy.

†*Vivax*=lively.

*Distribution.*—Lowland forests of eastern Tabasco, southern Campeche, and southern and eastern Yucatan.

*Subspecific characters.*—General style of coloration similar to typical *Sciurus deppei* from northern Vera Cruz, but much paler, more rusty reddish on upperparts; outside of forelegs and feet clear gray, same color extending up as a well defined wash on side of shoulders; tops of hind feet like back but edged and sometimes washed with clear gray; top of tail more heavily washed with white; underparts white or grayish white distinctly clearer than in true *S. deppei* with no trace of buffy suffusion.

*Skull.*—Nearly typical but with rather heavier rostrum, broader nasals; smaller and rounder audital bullæ.

*Dimensions of type* (measured in the flesh).—Total length 373; tail vertebrae 168; hind foot 52.

*Remarks.*—The occurrence of a form of *Sciurus deppei* in the lowland forests of Campeche and Yucatan was quite unexpected. The new form lives in a drier climate than true *S. deppei* and this is well indicated by its clearer, more vivid, colors.

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THE EARLIEST GENERIC NAME OF THE NORTHERN  
FUR SEAL.

BY T. S. PALMER.

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Nine years ago I proposed *Callotaria*\* as a substitute for *Callorhinus* Gray, 1859, on the ground that the latter name was preoccupied by *Callirhinus* Blanchard, 1850, a genus of Coleoptera. Further investigation shows that *Callorhinus* was not, as commonly supposed, the first generic name applied to the northern fur seal, but that it was antedated more than forty years by *Otoes* G. Fischer. The latter name appeared in 1817† in a publication which is not generally accessible, and the description of this genus is therefore reproduced in full below:

*Otoes*, Fisch. ab ὠτῶεις, auritus. Otaries Peron. Les phoques a oreilles. Cuv. Règne an. I, p. 106.

Incisivi quatuor utrinque biacuminati, superiores exteriores simplices et minores, inferiores furcati, molares conici. Auriculæ distinctæ.

*Phoca jubata*, ursina, Lin. Gmel.

Reference to the Règne Animal which also appeared in 1817, the same year in which this description was published, shows that Cuvier recognized a group of eared seals under the designation 'Les Phoques a oreilles extérieures', which he suggested

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\*Proc. Biol. Soc. Washington, VII, p. 156, July 27, 1892.

†Mem. Imp. Soc. Nat. de Moscou, V, p. 445. 1817.

might prove to be generically distinct. In this group he placed *Phoca jubata* Gmelin and *P. ursina* Gmelin. *Phoca jubata* Gmelin is a composite species based in part on a southern fur seal and in part on the northern sea lion, *Leo marinus* of Steller = *Eumetopias stelleri* of recent authors. The name had been, however, previously applied by Forster, in 1775, and is now generally restricted to the southern fur seal. *Phoca ursina* Gmelin (= *P. ursina* Linn.), is the northern fur seal of Bering Sea and, as the only identifiable species in the group, may be considered the type of *Otoes*.

It may be objected that Fischer did not name the northern fur seal, but merely applied a generic name to the eared seals in general or renamed *Otaria* of Péron. This, however, was not the case. Péron's *Otaria* had appeared only the year previous, and there is no evidence that Fischer had ever seen the description. What he did was simply to apply a generic name to Cuvier's group which, as shown above, was based chiefly on the northern and not on the southern fur seal.

Three different generic names are now applied to the northern fur seal: *Callotaria*, *Callorhinus* and *Arctocephalus*\*. The general adoption of *Otoes* would obviate this confusion, and the species thus far described would stand *Otoes ursinus* (Linnæus), *Otoes alascanus* (Jordan & Clark), and *Otoes curilensis* (Jordan & Clark).

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\*W. L. Sclater, Mammals of South Africa, I, p. 118, 1900, gives the type of *Arctocephalus* Cuvier, 1826, as *Phoca ursina*.



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A NEW POCKETMOUSE FROM SOUTHERN  
CALIFORNIA.

BY EDGAR A. MEARNS.

The form of *Perognathus fallax* inhabiting the eastern or desert slopes of the mountains of Riverside and San Diego counties, California, and thence southward along the eastern slope of the Coast Range into Lower California, is almost as pallid as the pocketmouse of the Colorado Desert which Mr. Osgood named *Perognathus penicillatus angustirostris*. The name *fallax*, in a subspecific sense is here restricted to the animal of the coastal region, although the type and series of topotypes, from Reche Canyon, three miles southeast of Colton, San Bernardino County, California, are almost exactly intermediate between it and the desert race. The darkest individuals examined are from Rose Canyon and San Pasqual Valley, on the western border of San Diego County.

***Perognathus fallax pallidus* subsp. nov.**

PALLID POCKETMOUSE.

*Type*.—No. 61,007, United States National Museum. Skin and skull of adult female, from Mountain Spring, half-way up the east slope of the Coast Range Mountains, on the Mexican Boundary Line, in San Diego County, California. Collected May 16, 1894, by Edgar A. Mearns. Original No. 3520.

*Subspecific characters.*—Size and cranial characters exactly like those of *Perognathus fallax fallax*. Pelage light gray (No. 9 of Ridgway's color manual) at base instead of dark gray (No. 6, Ridgway), and the general effect pale broccoli-brown instead of bistre above, where it is much more lightly mixed with black than in *fallax*; tail-stripe drab instead of hair-brown; lateral line and subterminal zone of hairs of upperparts pale pinkish buff; feet and underparts creamy white; ears with a few white hairs anteriorly. Young, pale smoke-gray above.

*Measurements.*—Average of six adult females from the east slope and notch at summit of Coast Range Mountains, near the Mexican boundary (Mountain Spring to Jacumba): length, 195 mm. (188–206); caudal vertebrae, 107 (98–112); hind foot, 24.2 (23.7–25); ear from crown, 6.9 (6.5–7).

*Distribution.*—Specimens have been examined from San Jacinto Lake, Riverside County, California; San Felipe Canyon, Mountain Spring, wagon-pass at summit of Coast Range, and Jacumba Hot Springs, in San Diego County, California and Lower California.

*Acknowledgments.*—I am indebted to the authorities of the United States National Museum and the Biological Survey of the Department of Agriculture for the use of the required materials, and to Mr. Wilfred H. Osgood for assistance in studying the group.

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## THE AMERICAN JAGUARS.

BY EDGAR A. MEARNS.

The jaguars of South America are readily distinguishable from the forms to the northward by cranial and dental characters, as shown beyond.

The materials from South America in the collection of the United States National Museum, including those of the Biological Survey of the United States Department of Agriculture, aggregating ten skulls and one mounted specimen, are insufficient for elucidating the southern forms which, collectively, represent the '*Felis onca* Linnaeus' of modern authors. Considerable variation is observed in the skulls of eight males from Brazil, Paraguay, Bolivia, and Parana. The largest of these (No. 4128, U. S. National Museum) is from Paraguay, and measures 242 mm. in basilar length (Hensel). The audital bullae are much flattened, with the space between them and the mastoid and paroccipital processes completely filled. The teeth give the following measurements: crown of upper carnassial, 29 by 15.6 mm.; crown of middle upper premolar, 20.3 by 11; length of upper canine, from gums, 43; length of incisor series, measured on alveoli, 35. Compared with the above specimen, the skull of No. 4361, also collected by Captain T. J. Page, U. S. N., at San Jose, Parana, measures only 212 mm. in basilar length, but has relatively heavy dentition, the

crown of upper carnassial measuring 31 by 16; crown of middle upper premolar, 20 by 13; length of upper canine from gums (tooth worn), 37; length of incisor toothrow, 33.5. The audital bullæ are greatly flattened, the space between bulla and paroccipital filled, but that between it and mastoid not completely so. Brazilian skulls are somewhat smaller than those from Parana, Paraguay, and Bolivia, and have smaller teeth, less flattened audital bullæ; and in some there is a sulcus between the bulla and the mastoid process.

The jaguars of South America may be distinguished from those of Central America and Mexico as follows:

***South American Jaguars.***

Postpalatal fossa, in adult male, more than 23 mm. wide.

Audital bulla flattened, with space between it and paroccipital and mastoid processes filled up.

Length of second and third premolars, taken together, more than 45 mm.

Maximum diameters of male skull, 300 by 200 mm.

***Mexican and Central American Jaguars.***

Postpalatal fossa less than 23 mm. wide.

Audital bulla inflated, with deep fossæ between it and the mastoid and paroccipital processes.

Length of second and third premolars, taken together, less than 45 mm.

Maximum diameters of male skull, 280 by 180 mm.

The remaining forms, from north of South America, of which I have examined six skins and thirteen skulls, may be identified by means of the following key:

Skin with a rosette pattern, in black, extending from neck to hips and from vertebral line to belly. Outer surface of ear, all black. Skull of male less than 215 mm. in basal length. Inhabits Central America, from Honduras to Panama..... *Felis centralis*.

Skin with distinct rosettes only on middle dorsal area; elsewhere they are disorganized into isolated black spots. Outer surface of ear with a tawny central spot. Skull of male more than 215 mm. in basal length. Distributed throughout the lowlands of Mexico and the adjacent border of the United States.

Coloration pallid, ground color ochraceous buff, black spots small. Inhabits the Arid Tropical areas of Mexico, north to the United States..... *Felis hernandesii*.  
 Coloration intense, ground color tawny ochraceous, black markings much larger. Inhabits Humid Tropical areas of Mexico, (north to Texas ?) .....  
 ..... *Felis hernandesii goldmani*.

**Felis centralis** sp. nov.

CENTRAL AMERICAN JAGUAR.

*Type*.—Skull No. 14,177, adult male, from Talamanca, Costa Rica, collected by Professor William M. Gabb. (The skin, No. 12,177, U. S. National Museum, seems to have been destroyed.)

*Characters*.—Smallest of the Jaguars. Length of adult male, 1800 mm. Basal length of male skull, 200 to 212. Dentition weak, upper premolar series measuring, on alveoli, 49 to 53.5. Coloration intense; upper surface of body with a median chain of black spots, bordered by five rows of black-bordered rosettes, on a ground of clay color; outer surface of ear, black, excepting a few tawny hairs; chest and belly heavily blotched with black.

*Color*.—Skin No. 61,192, U. S. National Museum collection, from Costa Rica, received from the Costa Rican Commission, World's Columbian Exposition, has the upperparts with a median chain of black spots, bordered on each side by about five longitudinal rows of black rosettes occupying the back and sides, on a ground of clay color. The median dorsal area consists of a chain of confused double spots tending to coalesce anteriorly and appearing as distinct, oval, paired blotches posteriorly. The lateral rows of rosettes, which vary from 50 to 100 millimeters in diameter, increase in size from the vertebral line to the belly, enclosing light areas of correspondingly increasing size, clay color slightly tinged with tawny, and containing from one to five small, rounded, black spots. The upper side of neck, and crown, have the ground color slightly suffused with tawny, the former having a modification of the rosette pattern of the black spotting of the back, the latter being rather uniformly covered with rounded black spots, from five to fifteen millimeters in diameter, smallest anteriorly, extending from opposite the anterior border of the eyes to opposite the posterior border of the ears. Muzzle, clay color, finely and evenly sprinkled with black hairs, leaving a plain, pale buffy crescent bordering the median upper margin of the nasal pad. A large black spot borders the upper, and another the lower lip. Ears, solid black on outer surface, excepting a few tawny hairs in middle; inner surface clay color, edged with tawny on anterior margin. Bristles of upper lips and above eyes, mixed black and white. Eyelashes and a few long hairs on sides of base of nose, black. Outer surface of limbs, clay color, coarsely blotched with black, the spots decreasing in size and becoming more rounded from the body

to the toes, those of the arms and thighs measuring 30 to 60 millimeters in diameter. Claws, horn color. Tail spotted and banded with black, the intervening areas being clay color or somewhat hoary nearest the tip, which is broadly black. The upper side of tail has more black than light, the under side having the black and clay-colored areas about equal in amount. In the median line, above, each light ring has a black spot, and the last pale rings are mixed with black hairs. There are three subterminal bands of solid black above, the more proximal ones being interrupted. On the under side of tail the pattern is confused and the light areas whitish. Underparts buffy white, heavily blotched with black. Under side of body with a median chain of small black spots, and two rows of somewhat quadrate black blotches on either side, the spots averaging about fifty millimeters in diameter. On the under side of neck and head, the black spots, which are much smaller than those on the chest and abdomen, tend to form transverse chains, while those of the cheeks and muzzle are arranged in longitudinal series.

The flat skin of a jaguar taken about 100 miles up the Segovia River, which forms the boundary between Nicaragua and Honduras, killed by Mr. Charles H. Townsend of the United States Fish Commission, closely resembles the specimen from Costa Rica just described, differing in being slightly more intense in coloring, the vertebral spots coalescing so that an interrupted median dorsal stripe is formed; and some spots in the lateral rows are filled with black, others having the rosettes elongated and resembling the outline of the animal's hind foot, small black spots suggesting the pads or tubercles. In general, the two may be considered to be identical.

*Skull and teeth.*—Skull high, narrow interorbitally, with small, pointed audital bullae. Dentition weaker than in the remaining forms (see measurements).

*Measurements.*—Following are measurements taken from the skin of an adult male, No. 61,192, U. S. National Museum Collection: length, 1800 mm.; tail, 575; hind foot, 220; ear from crown, 60; chord of longest hind claw, 23; fore claw, 26. The flat skin described above, from Honduras, has the end of the tail gone; its head and body measure 1475 mm. in length. Measurements of skulls of two adult males (Nos. 14,177 and 14,176, both from Talamanca, Costa Rica, collected by Professor W. M. Gabb): basilar length, 200, 212; zygomatic breadth, 169, 175; mastoid breadth, 102, 105; distance between orbits, 42.5, 45; between tips of post-orbital processes, 68, 70.5; postorbital constriction, 41.5, 43; length of nasals, on median line, 59, 66; greatest breadth of nasals, 38, 43; distance from foramen magnum to hinder margin of palate, 103, 108; from posterior margin of palate to middle incisor tooth, 98, 106; length of interpterygoid fossa from base of hamular process, 33, 37; distance between upper carnassials, 52.5; 56; distance between upper canines, 32, 36.5; greatest length of mandible, 167, 180; greatest height of mandible, 81, 84; length of upper incisor series, measured on alveoli, 29, 32; distance across upper canines, measured on alveoli, outside, 65, 69; length of upper lateral toothrow, 75, 82.5; length of upper premolar

series, measured on alveoli, 49, 53.5; crown of upper carnassial tooth, 25.3 by 13.7. 26.5 by 13.9; crown of middle upper premolar, 17.5 by 9, 18 by 9.

***Felis hernandesii* (Gray).**

MAZATLAN JAGUAR.

*Leopardus hernandesii* Gray, Proc. Zool. Soc. London, 1857, p. 278, Mamm. pl. LVIII (colored). Type from Mazatlan, State of Sinaloa, Mexico.

*Felis onca* Alston, Biologia Centrali-Americana, Mammalia, 1879-'82, p. 58. (Part.)

*Characters*.—Size larger than *Felis centralis*, smaller than *F. onca*. Coloration pale, with black markings greatly reduced in size, on a ground color of ochraceous buff, the black-bordered rosettes being confined to the upper portion of the middle dorsal region and elsewhere broken up into isolated spots.

*Color*.—Ground color ochraceous buff. The pattern of the black markings is quite different from *Felis onca* and *F. centralis*, as pointed out by Doctor J. E. Gray (P. Z. S., 1857, p. 278) and shown in his excellent colored figure, taken from the living animal. He states that "instead of the spots being all placed in rings or roses, as they are usually called, the spots on the front part of the body are single and scattered, and those on the hinder part of the body are alone placed in rings or roses." Later (P. Z. S., April 11, 1867, p. 402), Gray continues: "The specimen which I described under the name of *Leopardus hernandesii* \* \* \* has come into the British Museum collection; and I cannot find any difference in the skull to distinguish it from the other specimens of the Jaguar; so I suppose it must be considered one of the varieties of that species, marked by the distance at which the small spots are placed from each other, only now and then forming anything like a distinct ring or row of spots." The skin described below, lent me by Doctor A. K. Fisher, is essentially a topotype, collected at Cascalotlan (near Mazatlan), in the State of Sinaloa, Mexico, by Mr. Edward W. Nelson. In this specimen, the chain of black markings along the vertebral line is disorganized anteriorly, and consists of paired round or elliptical spots, more or less fused and irregular on the posterior half of body, and traceable to the middle of the tail as a dorsal series of narrowly-elongate, black spots; it appears as a narrow, interrupted line on the crown and neck. The rosettes are restricted to the region behind the shoulders, and, even there, are mostly broken up into scattered spots; and they do not tend to completely encircle light areas, which latter seldom contain black spots. The rosettes become vague after the first two or three rows, disappearing in a succession of scattered spots upon the sides so that it is impossible to count the number of rows, as is easily done in *Felis onca* and *F. centralis*, though the number of rows suggested by the scattered spots is obviously greater than in those

species. The black spotting extends over the outer surface of the limbs. The whole top and sides of the head, excepting the muzzle above, are quite evenly covered with rounded black spots, measuring 5 to 10 mm. in diameter, those on sides of muzzle forming longitudinal rows; upper side of muzzle ochraceous buff finely mixed with black hairs. Ears clothed inside with buffy-white hairs; outer surface black, with a large tawny spot occupying the middle portion. Tail ochraceous buff above, grayish white below, longitudinally striped with black on proximal three-fifths, and transversely banded with black on terminal two-fifths, the last three or four light rings being grayish. Underparts buffy white, rather lightly banded with elongate (not quadrate) black spots.

*Skull and teeth.*—The collection of the United States National Museum contains but two skulls of *Felis hernandesii hernandesii*, both females of which measurements are given below.

*Measurements.*—The flat skin described above is 1090 mm. in total length; tail, 650. Measurements of two skulls of adult females (No. 6480, U. S. National Museum, from near Colima, Mexico, and No. 88,044, U. S. Nat. Mus., Biological Survey Collection, from San Blas, Mexico): basilar length, 181, —; zygomatic breadth, 156, 159; mastoid breadth, 95, —; interorbital breadth, 45, 46; distance between tips of postorbital processes, 72, 70; postorbital breadth, 45, 50; length of nasals on median line, 53, 55; greatest breadth of nasals, 36, 37; from foramen magnum to hinder margin of palate, 90, —; from posterior margin of palate to middle incisor tooth, 91, 87; length of postnasal fossa from base of hamular process, 26, 28; distance between upper carnassials, 53, 54; distance between upper canines, 31, 34; greatest length of mandible, 150, 154; greatest height of mandible, 67, 72; length of upper incisor toothrow, measured on alveoli, 29.5, 28.5; distance across upper canines, 63, 61; length of upper lateral toothrow, 71, 72; length of premolar series, measured on alveoli, 49, 48; crown of upper carnassial, 25.8 by 13, 24 by 13; crown of middle upper premolar, 16.2 by 8.4, 16.2 by 8.2.

***Felis hernandesii goldmani* subsp. nov.**

CAMPECHE JAGUAR.

*Type.*—Skin No. 105,930, U. S. National Museum Collection, taken at Yohatlan, Campeche, Mexico, January 5, 1901, by Mr. Edward A. Goldman of the Biological Survey, United States Department of Agriculture.

*Character.*—Pattern of coloration as in typical *Felis hernandesii*, but color much more intense; black markings greatly increased in size; ground color tawny ochraceous; tail largely black above.

*Color.*—Upperparts tawny ochraceous, heavily spotted with black. In the type specimen, the dark vertebral area is composed of a chain or double row of black spots, separate and elongate on the neck, rounded and more or less joined together opposite shoulders and on rump, and forming a practically complete dorsal stripe on middle of back. The rosettes, which are almost confined to the middle dorsal area, do not



tend to completely encircle light areas, and, together with the other black markings, are disposed as in *F. hernandesii*, but are very much increased in size. There is no light spot at the upper margin of the nasal pad. Ears whitish cream-buff within, black without, edged anteriorly with tawny, and with a large tawny spot on middle of black external surface. Tail irregularly spotted and banded with black, which color greatly predominates. At base of tail, the light areas are tawny above and white or grizzled below: terminal four or five light rings, hoary grayish, becoming successively narrower until obsolete towards the tip, which is all black. Underparts buffy white, heavily banded with elongate (not quadrate) black spots.

*Skull and teeth.*—Decidedly larger than *Felis centralis*, the largest skull equalling the smallest adult male of *Felis onca* from South America. Teeth larger than those of *F. centralis*, smaller than in *F. onca*. The premolar teeth are narrower than in South American jaguars. The skull as a whole, aside from general size, is much more heavily ossified than in *Felis centralis*, in this respect being comparable with the South American *F. onca*, from which it is geographically separated by the range of *F. centralis*.

*Measurements.*—The skin of the type measures 1910 mm. in total length: tail, 670. Skulls of three adult males (Nos. 100,541, U. S. National Museum, Biological Survey Collection, from Palenque, State of Chiapas, Mexico: 9703, U. S. National Museum, from Tehuantepec, Mexico: 67,403, U. S. National Museum, Biological Survey Collection, from San Andres, State of Vera Cruz, Mexico) present the following dimensions: basilar length of Hensel, 211, 217, 227; zygomatic breadth, 178, 188, 180; mastoid breadth, 111, 112, 113; least interorbital breadth, 49, 51, 50; distance between tips of postorbital processes, 74, 81, 75; least postorbital breadth, 44, 47, 46; length of nasals on median line, 62, 67, 66; greatest breadth of nasals, 43, 46, 48; distance from foramen magnum to posterior border of palate, 109, 111, 115; from posterior border of palate to middle incisor tooth, 104, 109, 111; length of postpalatal fossa from base of hamular process, 35, 36, 36; distance between upper carnassial teeth, 60, 57, 58; between upper canines, 36, 36, 39; greatest length of mandible, 178, 179, 182; greatest height of mandible, 90, 93, 90; length of upper incisor toothrow, measured on alveoli, 32, 31, 33; distance across upper canines, 71, 69, 72; length of upper lateral toothrow, 78, 79, 82; length of premolar series, measured on alveoli, 52, 50, 54; crown of upper carnassial, 27 by 13, 25 by 14, 27 by 14; crown of middle upper premolar, 17.3 by 9.2, 17 by 10, 18 by 9.3.

*Remarks.*—In true *hernandesii*, from the arid region of Mazatlan, in the State of Sinaloa, not only is the ground color paler, but the light areas are increased in size at the expense of the black, giving a decided pallor. The pattern of the tail markings becomes evident in *hernandesii* through reduction of black, and appears as interrupted longitudinal stripes on basal three-fifths of tail: ground color buff at base, darkest above and whitish below, and the subterminal hoary bands more plainly marked than in *goldmani*.



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DESCRIPTION OF A NEW OCELOT FROM TEXAS  
AND NORTHEASTERN MEXICO.

BY EDGAR A. MEARNS.

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Comparison of the ocelots in the United States National Museum Collection shows the single form represented from the United States and northern Mexico to be distinct from those to the southward. None of the numerous names hitherto applied to members of the *Felis pardalis* group of long-tailed cats relate to this animal.\* It has heretofore been supposed to be

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\*The name *Felis albescens* of Pucheran, Voyage Venus, Zoology, mammifères, etc., p. 149; atlas, pl. VIII, 1855, is a pure substitution for the *Felis brasiliensis* of Frederic Cuvier, which latter was based on a specimen received from Cuba, and supposed to have been brought thither from Brazil. Although Pucheran mentions and describes a male specimen sent from Arkansas, in the State of Louisiana, by Trudau, he distinctly states that his name *albescens* is a substitution for *brasiliensis* of Fr. Cuvier, of which it therefore becomes a synonym.

Under the name *Panthera ludoriciana*, Fitzinger, the compiler, describes an intensely-colored ocelot, similar to Hamilton Smith's colored figure 'No. 3,' and gives its range as North America, Louisiana and Arkansas. The animal described (Sitzungsberichte der Akademie der Wissenschaften, Wien, LIX, 1869, p. 258) is smaller, with heavy black markings and reddish-brown coloring above, obviously differing from the form here described. The synonymy is composite, including *Felis tigrina* Erxleben and the Mexican ocelot figured in Griffith's edition of Cuvier's Animal Kingdom as variety No. 3 of Hamilton Smith. Pucheran's *Felis albescens* is not given as a synonym, although a specimen from Arkansas is described.

identical with the *Felis pardalis* of Linnæus, which was based primarily on the 'Cato-Pardus mexicanus' of Hernandez.

***Felis limitis* sp. nov.**

RIO GRANDE OCELOT.

*Type* adult male, No.  $\frac{11453}{102}$ , U. S. National Museum, Biological Survey Collection, taken at Brownsville, Texas, March 4, 1892, by Mr. F. B. Armstrong. Original No. 102.

*Character.*—Smaller and grayer than *Felis pardalis* Linnæus, with coloration less intense. Skull relatively broad: dentition weaker: interpterygoid fossa wider and more quadrate: audital bullæ wider and more inflated: postorbital process more flattened and less depressed.

*Color.*—Winter pelage: Upperparts exquisitely lined and spotted with black on a drab-gray ground. The ground color varies from whitish drab-gray on the unenclosed areas to pale broccoli brown on those that are enclosed or margined with black. The pattern is never exactly the same on any two specimens, although the general effect is similar. There is a distinct vertebral area marked with black, usually appearing as a more or less broken or irregular line of black on the posterior three-fifths, breaking up into parallel or divergent lines or spots anteriorly: it is usually apparent from the occiput to the root of the tail, though always an interrupted line. In places, especially on the rump, it often becomes a single or double row of black spots, while anteriorly it may change to parallel lines or elongated enclosures. On each side of the vertebral line is a parallel series of enclosed or (occasionally) solid black elongate areas, sometimes containing black spots. Succeeding these, laterally, are series of elongate, partially or completely enclosed spots or irregular bands of drab-gray having a trend downward and backward, and separated from one another by grayish-white areas, an especially broad transverse one usually appearing behind the shoulder. Upper side of neck with longitudinal black stripes enclosing drab-gray areas anteriorly and usually open posteriorly. Upper side of head with a broad black, usually interrupted line arising about ten millimeters above the middle of the orbital ring and extending backward on either side to opposite the middle of the ear: between these lateral bands are several interrupted lines of spots, larger behind and breaking up into small spots anteriorly. Eyelids blackish, bordered above and below by whitish bands, succeeded by drab-gray. Side of head with two conspicuous black longitudinal stripes, the upper one commencing as a black spot behind nostril, another in front of inner canthus and involving upper and lower eyelids, extending thence to a point about thirty millimeters below and behind the posterior root of the ear: lower stripe, beginning behind whiskers and below middle of orbit, extends backward to behind ear, then transversely across under side of head, almost joining the corresponding stripe of the opposite side. The space between these black lines is white except anteriorly: that between the up-

per one and the lateral crown stripe forms a large drab-gray triangle, between the eye and ear, in which there are but few small black spots. Muzzle, above plain drab-gray, lined on sides with spots of black edged with drab, and plain grayish white posteriorly. Whiskers mostly white, some becoming brownish black at base. Ear with concavity well coated with whitish-buff hairs; convexity black anteriorly, grayish white posteriorly, the latter encroaching on the middle of the black area, forming a rounded spot, which, in one individual, is narrowly encircled by black posteriorly, cutting it off from the whitish posterior third of the ear. Outer surface of limbs transversely spotted with black, the spots decreasing in size from within outward, becoming obsolete on the toes. Underparts white, very slightly tinged with ochraceous, the pelage drab-gray at base; chin and throat, middle of neck, and belly between thighs, unspotted. Under side of neck with two transverse bands of black slightly mixed with fulvous, interrupted at median line. Hinder part of neck finely spotted with black; chest and belly coarsely spotted, the black spots rounded on chest and transversely elongated on abdomen. Inner surface of limbs, whitish, transversely spotted with black. Under side of feet, hair brown, sometimes mixed with hoary. Tail, whitish gray, speckled with black below; upper surface irregularly barred with light and dark bands, the former grayish white, the latter drab-gray, edged with black, and somewhat grizzled; light rings averaging about ten.

The description of color is based on skins from Fort Clark and Brownsville, Texas. Six from the latter locality were kindly loaned me by Doctor C. Hart Merriam, Chief of the Biological Survey, U. S. Department of Agriculture. These specimens are quite similar except that one immature female (No. 32,681) is remarkable for intensity of the black markings. All were killed in February and March. The summer pelage appears to be more tawny than that of winter; but the available summer skins are unreliable, having been immersed in a fluid that has probably changed the color. For the same reason, no satisfactory comparison of coloration can now be made with *Felis pardalis*.

*Skull and teeth.*—Compared with *Felis pardalis* Linnæus the skull of *F. limitis* is smaller, relatively short and broad, the postpalatal fossa averaging considerably wider and more quadrate, the audital bullæ much broader and more inflated, and the postorbital processes more flattened and less depressed. The skull of the type, an old male of maximum size, measures as follows: basilar length (Hensel), 114 mm.; zygomatic breadth, 93; width of audital bulla, 17; length of upper lateral toothrow, measured on alveoli, 40; upper premolar series, 28; upper incisor series, 15; crown of upper carnassial tooth, 15.8 by 7.8; crown of middle upper premolar, 10 by 5; lower lateral toothrow, 45. A younger, nearly adult male (No. 7083, U. S. National Museum), from Mirador, Mexico, is considered to represent *Felis pardalis* Linnæus, and presents the following dimensions: basilar length, 122; zygomatic breadth, 91; width of audital bulla, 16; length of upper lateral toothrow, 43.5; upper premolar series, 30; upper incisor series, 17; crown of upper carnassial

tooth, 16.7 by 8.3; crown of middle upper premolar, 11 by 6.4; lower lateral toothrow, 50; but a strictly comparable male skull (No. 14,180, U. S. National Museum), from Talamanca, Costa Rica, gives the following measurements: basilar length, 134; zygomatic breadth, 108; width of audital bulla, 16.3; length of upper lateral toothrow, 47; upper premolar series, 31; upper incisor series, 17; crown of upper carnassial tooth, 17 by 9.3; crown of upper middle premolar, 11 by 6.5; lower lateral toothrow, 53.

*Measurements.*—Type (old male): length, 1080 mm.; tail vertebrae, 330; length of hind foot, 160; ear above crown, 50. Females average about as follows: length, 950; caudal vertebrae, 300; hind foot, 145; ear above crown, 50. Skulls: greatest diameters of largest male, 140 by 93; largest female, 126 by 87.

*Specimens examined.*—Seventeen, from the following localities: Fort Clark, Kinney County, Texas, 1; Eagle Pass, Texas, 2; Fort Ringgold, Texas, 1; Brownsville, Texas, 6; Matamoras, State of Tamaulipas, Mexico, 7.

PROCEEDINGS  
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TWO NEW CATS OF THE EYRA GROUP FROM  
NORTH AMERICA.

BY EDGAR A. MEARNS.

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On comparison of the very distinct new species of eyra cat here described as *Felis fossata* with the descriptions of *Felis eyra* Fischer (1814, based on Azara), the former was found to be a much larger animal, the bare skull measuring one-half inch more in length than the entire head of *Felis eyra*, according to the measurements given by Dr. J. R. Rengger,\* an extremely careful naturalist. Rengger's external measurements of eyra cats from Paraguay are slightly greater than those given by Azara. The animal described and figured by Baird as *Felis eyra*,† belonged to a species as large as *Felis fossata*, consequently much larger than *Felis eyra* Fischer. The water-color drawing, taken from Dr. Berlandier's original, from which Baird's colored figure was reproduced, depicts the animal "as a uniform light reddish-brown, without any spots whatever, and no lightening of tints beneath. The ears are rather pointed. The tail is slender and tapering gently to the tip, which is not tufted. The tail is rather longer than the body, by about half

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\*Naturgeschichte der Säugethiere von Paraguay, 1830, p. 200.

†Mammals of North America, 1857, p. 88, pl. LXII, fig. 1 (animal), pl. LXXIII, fig. 2 (skull); Report United States and Mexican Boundary Survey, II, 1859, p. 10, pl. II, fig. 1 (animal), pl. XIII, fig. 2 (skull).

the length of the neck. The figure also represents the pupil as vertical; other authors describe the pupil of *F. eyra* as round." (Baird.) On account of the larger size of this animal, and the absence of the white or whitish markings on the head, described by Azara,\* Fischer, Rengger, and other authors in their accounts of *Felis eyra*, the animal described by Baird under that name must be considered a distinct species, especially now that another species of the eyra (*Felis fossata*) has been found inhabiting Central America. I propose the name *Felis apache* for the eyra cat of Tamaulipas, described by Berlandier and Baird in the works cited. The type will be skull No. 1373, United States National Museum; a youngish-adult female, collected by Dr. Berlandier, at Matamoras in the State of Tamaulipas, Mexico.

***Felis fossata* sp. nov.**

YUCATAN EYRA CAT.

*Type*.—No. 7036, United States National Museum: skull of adult from Merida, Yucatan, collected by D. Schott.

*Cranial characters*.—Skull narrow, its greatest diameters 91 by 60 mm.: convex posteriorly, flattened supraorbitally, with marked declination forwards from middle of nasals: interfrontal region with a deep fossa, V-shaped on section, 8 mm. in length, between the anterior extremity of the interfrontal suture and the nasal bones, which latter are similarly infolded, continuing the fossa forward to the extremity of the nasals as a groove which gradually decreases in depth towards their extremity: orbit relatively small; nasal bones narrow, elongated at sides, pointed posteriorly where they are bent downward to form the anterior portion of the frontal fossa; anterior narial opening high and narrow: infraorbital foramen single, and round: interorbital region narrow; jugal broad; posterior narial fossa wide, with a scarcely-perceptible postpalatal notch; audital bullæ elongate, high, pointed anteriorly, scarcely con-

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\*Azara gives the following: "Length, thirty-one inches; tail, eleven inches and a half, more bushy than that of the cat; and the other measurements proportioned to those of the preceding species [yagüarundi]. The whole coat is of a red colour, except the lower jaw, the mustachios, and a small spot on each side of the the nose, which are white. Its fur does not yield in softness to that of the preceding species [*Felis yaguarundi*], and would be highly esteemed by furriers." (London edition of Azara's Natural History of the Quadrupeds of Paraguay and the River La Plata, 1837, pp. 225-6.)



stricted laterally; sagittal and occipital crests moderately developed; dentition heavy, as compared with *Felis apache*.

*Comparison and cranial measurements.*—Elliot's account of the cranial characters of *Felis egra* Fischer,\* based on specimen No. 1226, British Museum Collection (locality not given), contains, besides nonessentials, the following: "nasals are broad, and on a line with the processes of the maxillas at their articulation with the frontal bone. \* \* \* Auditory bullæ prominent, oblong; mastoid foramen of a triangular shape. Zygoma well arched. Canines moderate." No cranial measurements are given. The skull of the type and only specimen of *Felis fonsatta* differs from the above in having the nasals bones narrow, audital bullæ pointed, mastoid foramen oval, zygoma slightly arched, canines large. The skull of *Felis apache* is readily distinguished from that of *F. fonsatta* by the absence of a frontal fossa, the marked lateral constriction of the audital bullæ, the narrowness of the posterior narial fossa, and the small size of the teeth. It is also noted that the infraorbital foramina are double. The two species are of similar size. The following dimensions of the type skull of *Felis fonsatta* are followed by those of the type of *F. apache*, in parenthesis: basilar length of Hensel, 78 mm. (70); zygomatic breadth, 60 (60); least interorbital breadth, 16 (19); intertemporal breadth, 30 (32); breadth of braincase above auditory meatus, 42 (41); palate, length from hensation to posterior edge, excluding median notch, 33.7 (32.2); greatest diameter of orbit, 23 (20); greatest length of nasal bone, 23 (20); breadth of nasal bones opposite end of nasal processes of frontals, 7 (8.5); anterior narial orifice, 14 by 12 (12 by 11); breadth of jugal, 10 (7); audital bulla, 20 by 12 (18 by 10); breadth between outer corners of carnassials, 37.2 (33); breadth of posterior narial fossa, 13 (12); front of upper canine to back of carnassial, 27.5 (25); length of upper carnassial, 12.2 (11); length of lower carnassial, 9.4 (8.8).

\*Monograph of the Felide, 1883, p. 65.



PROCEEDINGS  
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ON THE MAINLAND FORMS OF THE EASTERN  
DEERMOUSE, *PEROMYSCUS LEUCOPUS*  
(RAFINESQUE).

BY EDGAR A. MEARNS.

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*Peromyscus leucopus* was originally described by Rafinesque from specimens taken during a journey through "the lower parts of the Ohio, the Wabash, Green River, Barrens, Prairies, and the states of Indiana, Illinois, &c." Kentucky is generally considered to be the type locality.\* Specimens from Lexington, Kentucky, collected by the writer and assumed to be typical, are found to agree with those from other parts of the austral zone east of the Mississippi River; but, in the transition zone, fairly well-marked geographical races occur in New York and New England in the East, and in Minnesota in the West. The range of the species does not extend beyond the northern boundary of the transition zone, but meets with that of *Peromyscus canadensis* at the lower edge of the boreal zone. In these forms, which may be recognized by the following descriptions, the under surfaces are white with more or less gray

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\*In a letter "dated at Louisville, Falls of Ohio, 20th July, 1818", published in the American Monthly Magazine, Vol. III, September, 1818, p. 354, Rafinesque states respecting "*Quadrupeds*": "I have discovered and described 3 new species: 1. *Musculus leucopus*; 2. *Gerbillus Sylvestris*; and, 3. *Noctilio mystax*, Raf."

at the base of the hair, and the general color above is broccoli-brown in summer, and cinnamon or yellowish wood-brown finely sprinkled with black in winter.

***Peromyscus leucopus leucopus* (Rafinesque).**

KENTUCKY DEERMOUSE.

*In summer* coated with short hairs: color broccoli-brown above, finely sprinkled with black, sparsely on the sides and thickly in a broad median dorsal area: ears scantily coated, hair brown, with scarcely perceptible hoary edges: eyelids bordered with black: feet scantily coated, the skin appearing between the hairs: tail plainly showing annuli above and below, and so scantily coated that it does not appear distinctly bicolored or slightly penciled at tip: underparts gray partly concealed by white tips to the hairs.

*In winter* more heavily coated: color yellowish wood-brown above, white below, with the gray underfur appearing between the white tips of the hairs: tail very slightly penciled, not very sharply bicolored, and with annuli seldom wholly concealed: feet and ears not well coated.

*Measurements*.—Total length, 180 mm.: caudal vertebrae, 80; hind foot, 21; ear above crown, 12.5.

***Peromyscus leucopus noveboracensis* (Fischer).**

NEW YORK DEERMOUSE.

*In summer* the whole animal is more heavily coated than in true *leucopus*, the skin of the feet being concealed by the hair: tail bicolor, with annuli usually concealed, and the tip well penciled: ears also a little more heavily coated: upperparts wood-brown instead of broccoli-brown.

*In winter* the coat is very full and long: tail moderately penciled, sharply bicolor, heavily coated, with the annuli entirely concealed: ears and feet well coated, the former with hoary edges and almost bushy at base, and the latter pure white: upperparts yellowish wood-brown: ears and upperparts generally more decidedly lined with black: pelage of underparts very dense, and white almost to the base.

*Measurements*.—Length, 185 mm.: tail vertebrae, 85; hind foot, 21; ear above crown, 13.5.

***Peromyscus leucopus minnesotæ* subsp. nov.**

MINNESOTA DEERMOUSE.

*Type*.—No. 82,717, United States National Museum Collection. Adult female, collected at Fort Snelling, Hennepin County, Minnesota, November 30, 1890, by Edgar A. Mearns. Original No. 1181.

*Characters.* Form stout; ears small, hairy on anterior half of outer surface; color decidedly paler than in the eastern forms; a whitish tuft, in winter, at anterior base of ear; pelage intermediate in length between the two eastern forms; skull as in the typical form.

*Color in summer.*—Upperparts light bistre, sparingly lined with black hairs; ears with outer surface sepia, hairy anteriorly and almost naked posteriorly, thinly coated with grayish hairs on inner surface, and faintly hoary on edge; feet and tail so scantily clothed that the skin and annuli are visible between the hairs; tail slightly penciled; gray of underparts partially concealed by white-tipped hairs.

*In winter* the upperparts are cinnamon, coarsely but sparsely lined with black; ears light brown instead of sepia, with a slight tuft of whitish hair at the base anteriorly, and with faint hoary rims; underparts white, the gray underfur being concealed; feet and tail moderately hairy, the latter slightly penciled.

*Young* mouse-gray above, grayish white below; ears slate-black on anterior band, grayish posteriorly, very faintly edged with hoary; tail hair-brow above, white below.

*Measurements.*—Length, 175 mm.; tail vertebrae, 75; hind foot, 21.5; ear above crown, 11.5.

1. The first part of the paper is a review of the literature on the effects of the 1997 Asian financial crisis on the economies of the Asian countries. The second part of the paper is a review of the literature on the effects of the 1997 Asian financial crisis on the economies of the Asian countries. The third part of the paper is a review of the literature on the effects of the 1997 Asian financial crisis on the economies of the Asian countries.

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DESCRIPTIONS OF THREE NEW ASIATIC SHREWS.\*

BY GERRIT S. MILLER, JR.

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Among the Asiatic shrews in the United States National Museum are two species that appear to have not yet been named. A third was recently submitted to me for determination by Mr. Oldfield Thomas.

***Crocidura ilensis* sp. nov.**

*Type*.—Adult female (skin and skull) collected in open grass country at Kukturuk, (altitude, 5400 ft.) Ili, central Asia, October 12, 1890, by P. Church. Original number, 4. Specimen to be presented to the British Museum.

*Characters*. In general similar to Kashmir specimens of *Crocidura myoides* (Blanford), but smaller. Color distinctly paler than in the Kashmir animal, the feet nearly white. Skull with more slender rostrum and smaller teeth.

*Color*. Dorsal surface pale drab, the hairs drab-gray subterminally and a gray about matching Ridgway's No. 6 (Pl. II) at base. Ventral surface silvery whitish gray in distinct but not sharply defined contrast with color of back. Feet whitish gray. Tail indistinctly bicolor, whitish gray below, drab above.

*Skull and teeth*. The skull is distinctly smaller than that of *C. myoides* and *C. rusaula*, which are of essentially the same size. In form, how-

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ever, it is not peculiar. Teeth as in *C. myoides* but smaller throughout. The unicuspid teeth resemble those of the Kashmir animal in their smaller size and less terete form as compared with those of *C. rusaula*.

*Measurements*.—External measurements of type: total length, 85; head and body, 55; tail vertebrae, 30; hind foot, 13; hind foot without claws, 12.

Cranial measurements of type: greatest length, 16.6; greatest postorbital breadth, 8.4; greatest antorbital breadth, 6; least interorbital breadth, 4; mandible, 10; entire maxillary toothrow, 8.4; entire mandibular toothrow, 8.

*Specimen examined*.—One, the type.

*Remarks*.—*Crociodura ilensis* agrees with *C. lignicolor* in size, but is very different in color. In the latter character it is almost identical with *C. sicula*, though lacking the faint broccoli-brown wash on the dorsal surface. The skull is only a trifle smaller than that of *C. sicula* and the toothrow as a whole is of about the same length; but the unicuspid teeth are much smaller.

#### ***Crociodura shantungensis* sp. nov.**

*Type*.—Adult (skin and skull) No. 86,151, United States National Museum. Collected at Chimeh, Shantung, northern China, June, 1898, by Paul D. Bergen.

*Characters*.—Size and general appearance as in *Crociodura ilensis*, but molar teeth both above and below distinctly smaller.

*Color*.—In color *Crociodura shantungensis* closely resembles *C. ilensis*, but the feet are less whitish and the dorsal surface is washed with broccoli-brown exactly as in *C. sicula*.

*Skull and teeth*.—The hinder part of the skull is broken away so that the form cannot be compared with that of the allied species. The rostrum differs from that of *C. ilensis* in greater relative breadth and depth. The teeth are throughout smaller than those of *C. ilensis*, but the difference is most noticeable in the molars. I can detect no tangible differences in form.

*Measurements*.—External measurements of type (from skin): total length, 87; head and body, 62; tail vertebrae, 25; hind foot, 13 (12).

Cranial measurements of type: entire maxillary toothrow, 7.8; greatest antorbital breadth, 5.4; mandible, 9; entire mandibular toothrow, 7.

*Specimen examined*.—One, the type.

*Remarks*.—While this species exactly resembles *C. sicula* in color, it is readily distinguished by its shorter, more bristly tail. In this character it differs from all the known European members of the genus and agrees with the Asiatic *C. myoides*, *C. ilensis*, and *C. lignicolor*.

#### ***Sorex macropygmæus* sp. nov.**

*Type*.—Adult male (skin and skull) No. 84,012, United States National Museum. No. 8019, Leonhard Stejneger. Collected at Petropaulski, Kamchatka, September 23, 1897, by Mrs. Stejneger.



*Characters.*—In general appearance similar to *Sorex minutus* but size considerably greater (hind foot, 13, greatest length of skull, 17).

*Color.* Upperparts sepia, slightly darker across lumbar region, and becoming paler on sides where a rather abrupt change takes place to the broccoli-brown of the underparts. Tail distinctly bicolor, dark sepia above and at tip, light shining broccoli-brown beneath. Feet like under surface of tail.

*Skull and teeth.*—The skull throughout is larger than that of *Sorex minutus*, forming in this respect an exact intermediate between that of the pigmy shrew and *Sorex araneus*. In form it is not peculiar.

Teeth as in *Sorex minutus* except that the third and fourth unicuspid are subequal when viewed from the side, that is the fourth is not distinctly smaller than the third as in the case in *S. minutus*.

*Measurements.* External measurements of type\*: total length, 107; head and body, 70; tail vertebrae, 37; hind foot, 13 (12).

Cranial measurements of type: greatest length, 17.6 (15.4)†; greatest postorbital breadth, 8.4 (7.6); greatest antorbital breadth, 4.4 (4); least interorbital breadth, 3.4 (2.8); mandible, 8 (6.6); entire maxillary tooth-row, 7.6 (6.8); entire mandibular tooth-row, 7 (6).

*Specimens examined.* Three (one in alcohol), all from the type locality.

\*From fresh specimen by collector.

†Measurements in parenthesis are those of an adult *Sorex minutus* from Upsala, Sweden.



PROCEEDINGS  
OF THE  
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SOME NEW AND ADDITIONAL RECORDS ON THE  
FLORA OF WEST VIRGINIA.

BY CHARLES L. POLLARD AND WILLIAM R. MAXON\*.

In the latter part of August, 1899, the writers spent four days in south central West Virginia, making collections of plants at Quinnimont, Fayette Co., and at Lowell, Summers Co., both on the line of the Chesapeake and Ohio Railroad. In view of the extensive additions to the known flora of the state recently published by Mr. E. L. Morris†, supplementing Millsbaugh and Nuttall's "Flora of West Virginia‡," it is quite significant of the work yet to be done that out of the total of 125 numbers of our collection 30 should be new to the state,—the majority being cryptogamous plants.

For the determination of the fungi we are indebted to Mrs. Flora W. Patterson; for that of the lichens to the late Thomas A. Williams; of the hepaticae to Dr. Marshall A. Howe; and of the mosses, with one exception, to Mrs. E. G. Britton. The names of species new to the flora are printed in bold-face type; those representing merely additional records, in small capitals.

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†Proc. Biol. Soc. Wash. 13: 171-182. 1900.

‡Field Columb. Mus. Pub. (Bot. Series) 1: 65-276. 1890.

### Thallophyta.

#### FUNGI.

**Uromyces Howei** Peck. On *Asclepias Syriaca*. Lowell, August 25. (No. 130.)

**Gnomonia ulmae** (Sacc.) Thum. On dead leaves of *Ulmus* sp. Lowell, August 25. (No. 131.)

#### Lichenes.

**Coenogonium interpositum** Nyl. Sterile; growing with thallus of *Cladonia* sp. Quinnimont, August 22. (No. 141.)

**Lecidea spelrea** Ach. Quinnimont, August 21. (No. 134.)

**Lecidea albocoerulescens** (Wulf.) Schaer. Quinnimont, August 22. (No. 138.)

**Pertusaria corallina** (L.) Fr. Quinnimont, August 22. (No. 140.)

**Parmelia cetrata** Ach.? Sterile, but probably referable to this species. Lowell, August 23. (No. 146.)

**Parmelia tiliacea** (Hoffm.) Flk. Lowell, August 23. (No. 151.)

**Cladonia squamosa** Hoffm. Quinnimont, August 22. (No. 143.)

**Cladonia squamosa denticollis** (Hoffm.) Flk. Quinnimont, August 22. (No. 136.)

**Placodium rupestre** (Scop.) Br. & Rostr. Quinnimont, August 23. (No. 155.)

**Theloschistes concolor effusa** Tuckerm. Lowell, August 23. (No. 150.)

**Verrucaria fuscella** (Tum.) Ach. Lowell, August 23. (No. 154.)

**Pyrenula punctella** (Nyl.) Williams, comb. nov. (*Verrucaria punctella* Nyl. Pyrenoc. 46, 1858.) Lowell, August 23. (No. 156.)

### Bryophyta.

#### HEPATICAE.

**Jungermannia Schraderi** Mart. Quinnimont, August 22. (No. 113.)

**Cephalozia Virginiana** Spruce. Quinnimont, August 22. (No. 115a in part, which is mostly *C. curvifolia*.)

#### Musci.

**Fissidens subbasilaris** Hedw. Lowell, August 23. (No. 117.)

**Ditrichum tortile** (Schrad.) Hampe. Quinnimont, August 21. (No. 105.)

**Thuidium delicatulum** (L.) Mitt. Quinnimont, August 21. (No. 111.)

**Thuidium minutulum** (Hedw.) Br. & Sch. (Determined by Dr. G. N. Best.) Lowell, August 23. (No. 118.)

**Amblystegium fluvatile** (Sw.) Br. & Sch. Quinnimont, August 21. (No. 110.)

**Rynchosstegium rusciforme** (Neck.) Br. & Sch. Quinnimont, August 21. (No. 109.)

**Hypnum Haldanianum** Grev. Quinnimont, August 22. (No. 115.)

### Pteridophyta.

**POLYPODIUM VULGARE DECEPTUM** Maxon, Proc. U. S. Nat. Mus. 23: 628. 1901. Quinnimont, August 21. (No. 25.)

### Spermatophyta.

**Andropogon nutans avenaceus** (Michx.) Hack. (Determined by Mr. Carleton R. Ball.) Common in bottom lands of the New River. Quinnimont, August 21. (No. 30.)

**TRAUTVETTERIA CAROLINENSIS** (Walt.) Vail. Quinnimont, August 21. (No. 26.) Growing in some abundance along the banks of Laurel Creek; this station confirms its existence in the State, as Doctor Millspaugh questioned the locality cited by him.

**Chamaecrista nictitans commixta** Pollard, and Maxon var. nov.

Plant of low stature, very densely and divaricately branching, the stems finely pubescent or puberulent; leaves resembling those of *nicitans*, but often with more numerous leaflets; petiolar gland cupulate or truncate, usually nearly sessile; flowers and fruit as in *C. nictitans*.

Type in U. S. National Herbarium, No. 357,000, collected by Charles L. Pollard and William R. Maxon in alluvial soil along the New River at Quinnimont, W. Va., August 21, 1899. (No. 31.)

**Galactia regularis** (L.) B. S. P. Quinnimont, August 21. (No. 29.) Bottom lands of the New River.

**Strophostyles helvola** (L.) Britton. Quinnimont, August 21. (No. 32.) Bottom lands of the New River.

**Physalis heterophylla** Nees. Quinnimont, August 21. (No. 38.) Bottom lands of the New River.

**TAGESTES PATULA** L. Quinnimont, August 21. (No. 20.) Escaped from cultivation along the railroad near Laurel Creek.

**SOLIDAGO NEGLECTA** Torr. & Gray. Quinnimont, August 21. (Nos. 33 and 34.) Bottom lands of the New River. Recently reported by Doctor Millspaugh from another locality in the State.



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NEW AND LITTLE-KNOWN COCCIDÆ. I.  
RIPERSIELLA AND CEROPUTO.

BY T. D. A. COCKERELL.

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**Ripersiella** Tinsley.

*Ripersiella*, Tinsley, in Cockerell, Canad. Entom., 1899, p. 274.

Dactylopiine Coccidæ with antennæ of not more than six joints, placed close together at the extreme anterior portion of the head. Type *Ripersiella rumicis* (= *Ripersia rumicis*, Maskell, Tr. N. Z. Inst., XXIV, 37).

Prof. Tinsley had intended to give an account of this genus, but he has been prevented by other duties, and at his suggestion I here set forth its characters. The appearance of the species is very peculiar, and anyone who has seen them alive is sure to be convinced of the validity of the genus.

*Ripersiella maritima* (= *Ripersia maritima*, Ckll., Insect Life, VII, 42) and *R. leucosoma* come nearer to *Ripersia* than the other two species. *R. Kelloggi* (Ehrh. & Ckll.) from Mountain View, California, departs farthest from the *Ripersia* type, having 5-jointed antennæ only about  $75\ \mu$  long, and  $15\ \mu$  apart, the second to fourth joints each about twice as broad as long.

**Ripersiella leucosoma** sp. n.

♀. Perfectly, white elongated, the largest about 3 mm. long; caudal lobes low and rounded, not at all prominent, with a couple of bristles like those of the anal ring; abdominal segments very convex on lateral margins; legs and antennæ pale reddish-brown; pairs of legs about 400  $\mu$  apart; hind legs about 1100  $\mu$  from end of body; hind legs with fe-

mur + trochanter about  $140\ \mu$ , tibia about 90, tarsus about 60; antennæ at extreme anterior end of body, which is somewhat pointed; antennæ 6-jointed, about  $120\ \mu$  apart, and about  $180\ \mu$  long: antennal joints in  $\mu$ , (1.) 30-39, (2.) 18-24, (3.) 30, (4.) 18-21, (5.) 18-21, (6.) 42-48; joints 4 and 5 about as broad as long, with convex sides; formula 6 (31) 2 (45) or 613 (245); mouth-parts (excluding rostral filaments) about  $220\ \mu$  long; labium narrow but not very long, about  $100\ \mu$  long and 50 wide.

*Hab.* Las Vegas, New Mexico, 6400 ft. alt., under rocks with *Lasius americanus*; first found by Wilmatte P. Cockerell, April 11, 1901. A larger insect than *R. maritima*, but closely allied.

### **Ripersiella kelloggi** Ehrhorn & Ckll., sp. n.

This species was found by Mr. Ehrhorn on roots of bunch grass at Mountain View, California, in December, 1898, but no description has yet been published. It is easily recognized by the characters mentioned above. The length of the last antennal joint is about  $30\ \mu$ . The mouth parts are ordinary, the labium not elongated.

### **Ceroputo** Sulc.

The genus *Ceroputo*, Sulc. was founded in 1897 for a species found in Bohemia, named *C. pilosella*, Sulc. It has never been recognized as American, but after a study of its characters, I find that the species of the group of *Phenacoccus yuccæ* are certainly congeneric. The genus is a fairly distinct one by the large size and spiny skin, with a frequent development of waxy lamellæ resembling those of *Orthozia*. The American forms are *Ceroputo yuccæ* (*Pseudococcus yuccæ*, Coquillett, W. Am. Sci., 1899, p. 44), *C. yuccæ mexicanus* (*Dactylopius mexicanus*, Ckll., Ann. Mag. Nat. Hist., (6) XII, p. 49), *C. barberi* (*Phenacoccus yuccæ barberi*; Ckll., Ann. Mag. Nat. Hist., (6) XVI, p. 61), *C. bahiæ* (*Phenacoccus bahiæ*, Ehrhorn, Can. Ent., 1900, p. 314), and *C. calcitectus* (*Phenacoccus calcitectus*, Ckll., Ann. Mag. Nat. Hist., (7) VII, p. 334).

In *C. barberi* the last three antennal joints are decidedly longer than in *C. yuccæ*. To the above must now be added the following:

### **Ceroputo lasiorum** sp. n.

♀. About 4 mm. long,  $2\frac{1}{2}$  broad, almost white, with a faint greenish tinge, covered with white secretion. The dense secretion covering the dorsum looks like wool, instead of having a chalky appearance as in *C. calcitectus*; it is also not separable into distinct lamellæ, nor are the hindmost lamellæ at all prolonged (in *calcitectus* they form two tails); in young individuals the lateral tufts are distinct. Legs pale reddish-brown; sepia brown in mounted specimens. Boiled in *liquor potassæ*, the ♀ turns pink, but does not stain the liquid.



Skin with many round glands, and small spines; sides with large brownish patches of spines; anal ring with six hairs. Claw with denticle on inner side; no tarsal digitules.

*Adult.* Measurements of antennae and legs in  $\mu$ : Antennal segments: (1.) 90, (2.) 90, (3.) 133, (4.) 90, (5.) 90, (6.) 90, (7.) 92, (8.) 90, (9.) 141. Formula 30:1245078).

Middle leg: femur + trochanter 640; tibia 500; tarsus (without claw) 200. Tarsal bristles about 60  $\mu$ .

*Penultimate stage.* Measurements in  $\mu$ : Antennal segments: (1.) about 60, (2.) 90, (3.) 126, (4.) 75, (5.) 75, (6.) 75, (7.) 75, (8.) 126. Only 8 joints. Anterior legs: femur + trochanter, 440; tibia 300; tarsus (without claw) 200.

Middle legs: femur + trochanter 460; tibia 400. Posterior legs: femur + trochanter 480; tibia 470; tarsus 200.

*Hab.* Las Vegas, N. M., April, in nests of *Lasius interjectus* under rocks. (Wilmette P. Cockerell.)



PROCEEDINGS  
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DESCRIPTIONS OF A NEW GENUS AND ELEVEN  
NEW SPECIES AND SUBSPECIES OF BIRDS  
FROM MEXICO.

BY E. W. NELSON.

The following descriptions are based upon material in the Biological Survey collection and mainly upon specimens obtained during a recent trip to the peninsula of Yucatan by Mr. E. A. Goldman and myself. I am indebted to Mr. Robert Ridgway and Dr. Chas. W. Richmond, Curator and Assistant Curator of Birds in the National Museum, for their usual kind assistance during the preparation of this paper.

All measurements are in millimeters.

***Crypturus sallæi goldmani***, new subspecies. Yucatan Tinamou.

*Type* No. 167,715. ♂ ad., U. S. National Museum, Biological Survey collection, from Chichen Itza, Yucatan, Mexico. Collected February 1, 1901, by E. W. Nelson and E. A. Goldman.

*Distribution*. Yucatan, Mexico.

*Subspecific characters*.-- ♂, smaller than typical *C. sallæi* with generally paler coloration; back grayer; the light transverse bars more strongly marked and extending farther forward on back and wings; underparts paler, more buffy (less rufous); ♀, paler and more strongly and extensively barred with light color on back and wings.

*Dimensions of type*.--Wing 152; tail 46; culmen 27; tarsus 44.

*Remarks*.--The males of the present form differ more from those of *C. sallæi* both in size and color than do the females.

**Bubo virginianus mayensis** new subspecies. Yucatan Horned Owl.

*Type* No. 167,727, ♀ ad., U. S. National Museum, Biological Survey collection, from Chichen Itza, Yucatan, Mexico. Collected February 1, 1901, by E. W. Nelson and E. A. Goldman.

*Distribution*.—Peninsula of Yucatan.

*Subspecific characters*.—Most like *B. virginianus pallascens* but much smaller with less clear gray and more dingy fulvous suffusion on entire dorsal surface including tail: sides of body, flanks and under tail coverts rather regularly barred with narrow dark bands, not crowded near tips of feathers as usual in *pallascens*; sides of flanks with concealed suffusion of dull buffy; middle of breast and belly dull white; lower half of tarsus and feet dull white without markings.

*Dimensions of type*.—Wing 335; tail 178; culmen 44; tarsus 66.

*Remarks*.—This is the smallest of the subspecies of *Bubo virginianus* and is a pale race probably limited to the arid part of the peninsula of Yucatan.

**Crax chapmani** new species. Chapman's Curassow.

*Type* No. 167,370, ♀ ad., U. S. National Museum, Biological Survey collection, from Puerto Morelos, Eastern Yucatan, Mexico. Collected March 28, 1901, by E. W. Nelson and E. A. Goldman.

*Distribution*.—Heavy forests of southern Campeche and southern and eastern Yucatan, Mexico: probably ranging thence into adjacent parts of Belize and Guatemala.

*Description of type*.—Head and throat dull white thickly and finely speckled with black on lores and around eyes; sides of crown more coarsely and sparingly black spotted; crest white with narrow black tips finely bordered with white; bases of crest feathers on front of crown with small black spots or incomplete bars: posteriorly crest feathers only marked at base with fine dark shafts or shaft streaks; neck all around from head to body strongly barred black and white—black bars broadest, and white bars on underside of neck more or less edged with buffy; shoulders, upper surface of wings and tail broadly and regularly barred with broad bands of blackish brown and slightly narrower bands of golden buffy; dark bars approaching black on shoulders and on outer half of tail; buffy bars with a decided grayish cast on outer half of tail: primaries mainly buffy, paler than same color on secondaries and more narrowly and irregularly barred and spotted with blackish and reddish brown; middle of back and rump narrowly barred with same colors as secondaries and tail: entire underparts including breast, abdomen, sides of body, flanks, thighs and undertail coverts uniform ochraceous buffy—a few narrow irregularly placed transverse blackish brown marks occurring on buffy feathers of fore breast; under side of tail black with narrow golden buffy transverse bars.

*Dimensions of type*.—Wing 380; tail 368; culmen 51; tarsus 116.

*Remarks.*—The discovery of this magnificent bird, one of the largest and handsomest of the genus, was a quite unexpected result of our work in Yucatan. Only a single specimen could be secured by us, although the feathers of others were seen about Indian camps in southern Campeche in December, 1900, by Mr. Goldman, and I came on a hunter in the forest in eastern Yucatan just after he had finished plucking one. They were evidently much less common than *Crax globicera*, though they frequent the same forests. Unfortunately we failed to secure a male so this sex remains unknown. The ovaries of the type were becoming enlarged showing that the breeding season was near, at the date of her capture.

The Maya Indians distinguish this species from the Cambúl (*Crax globicera*) and call it Bolonchan or Bolonchana.

It gives me pleasure to dedicate this fine bird to Mr. F. M. Chapman whose interesting 'Notes on Birds observed in Yucatan' (Bull. Am. Mus. Nat. Hist., VIII, 271-290, 1896) is the best local paper we have on the birds of this region.

**Nyctagreus\* new genus.**

*Type.* — *Caprimulgus yucatanicus* Hartert, Cat. Birds British Museum, XVI, 375, 1892.

*Distribution.* — Yucatan and Campeche, Mexico.

*Generic characters.*—Bill rather long and narrow; nostrils flattened oval, slightly tubular, situated well forward on bill and opening laterally; rictal bristles coarse, scarcely curved at tips; tarsus a little longer than middle toe without claw and bare of feathers except near proximal end, as in *Phalaenoptilus*; second and third primaries equal and longest; fourth a trifle shorter; first about 10 mm. shorter than second and about equal to fifth, thus giving a formula very close to *Otophanes*; tail slightly rounded and a little shorter than wing; plumage and color pattern as in *Antrastomus*.

**Nyctidromus albicollis yucatanensis new subspecies.**

Yucatan Parauque.

*Type* No. 107,682, ♂ ad., U. S. National Museum, Biological Survey collection, from Tunkaa, Yucatan, Mexico. Collected February 17, 1901, by E. W. Nelson and E. A. Goldman.

*Distribution.* Peninsula of Yucatan (including State of Campeche), Mexico.

*Subspecific characters.*—Larger and grayer than typical *N. albicollis*; a little smaller and darker grayish than *N. albicollis merrilli*; otherwise generally resembles latter in coloration but darker with smaller light

\*vúç=night; 'aypéúç=hunter.

spots on wing coverts; distal half of outer web of next to outer tail feather white with border of dark brown or blackish, but never wholly or mostly dark as usual in the other forms of this species.

*Dimensions of type.*—Wing 176; tail 165; culmen 15; tarsus 28.

*Remarks.*—The broad band of white next to shaft on outer web of next to outer tail feather appears to be a constant character in this form and gives the readiest means of separating it from specimens of *N. albi-collis* which approach it in color.

#### ***Attila mexicanus* new species.**

*Type* No. 166,431, ♂ ad., U. S. National Museum, Biological Survey collection, from Frontera, Tabasco, Mexico. Collected April 27, 1900, by E. W. Nelson and E. A. Goldman.

*Distribution.*—Tabasco, Eastern Mexico (Metlatoyuca, northeastern Puebla?).

*Specific characters.*—Similar to *Attila citreopygius* but larger: Crown and malar area streaked with black; top and sides of neck and back, to rump, dark russet brown; rump rich cinnamon brown shading into ochraceous on upper tail coverts; wing bars and edgings like back; upper side of tail slightly paler brown than back and darkest near tip; chin and throat grayish white streaked with blackish; fore breast flammulated with dull brown streaks edged with dull yellowish; abdomen white with pale rusty shafts; sides of breast like back; sides of body and flanks raw sienna, this color bordering and sharply contrasting with color of abdomen; under tail coverts chrome yellow.

*Dimensions of type.*—Wing 98; tail 82; culmen 28; tarsus 26.

*Remarks.*—The type of *Attila mexicanus* is from the coast forests of Tabasco and is the most strongly rufous of any species of the genus known north of Panama. A specimen in our collection from Metlatoyuca, Puebla, is equally large but is more like *A. citreopygius* in general appearance and probably represents a subspecies of *A. mexicanus*. A specimen from Palenque, Chiapas, is very near to typical *A. citreopygius* in size and color. Two males of the latter species in the National Museum from the Escondido River, Nicaragua, measure as follows viz.: No. 128,332: Wing 92; tail 72; culmen 26; tarsus 24. No. 128,333: Wing 91; tail 71; culmen 24; tarsus 24.

#### ***Myopagis yucatanensis* new species. Yucatan Flycatcher.**

*Type* No. 167,552, ♀ ad., U. S. National Museum, Biological Survey collection, from La Vega, Yucatan, Mexico. Collected March 22, 1901, by E. W. Nelson and E. A. Goldman.

*Distribution.*—Known only from type locality.

*Specific characters.*—Similar to *Myopagis placens* in coloration but much smaller, with entire crown dull broccoli brown overlying dull gray basal

color of feathers: concealed yellow crown patch very small and limited to part adjoining nape.

*Dimensions of type.*—Wing 62; tail 36; culmen 10; tarsus 17.

***Pachyrhamphus major itzensis* new subspecies.**

Yucatan *Pachyrhamphus*.

*Type* No. 167,706, ♀ ad., U. S. National Museum, Biological Survey collection, from Chichén Itza, Yucatan, Mexico. Collected January 29, 1901, by E. W. Nelson and E. A. Goldman.

*Distribution.*—Northern Yucatan.

*Subspecific characters.*—Smaller and paler than typical *P. major* from Jalapa, Vera Cruz. Compared with *P. major*: ♂, clearer white below, especially on throat and abdomen, with black area on back restricted or almost wanting. ♀, back duller, more grayish brown; underparts paler—a dingy primrose yellow.

*Dimensions of type.*—Wing 77; tail 37; culmen 14; tarsus 21.

*Remarks.* The males show rather stronger differences than the females.

***Icterus cucullatus duplexus* new subspecies. Island Oriole.**

*Type* No. 167,644, ♂ ad., U. S. National Museum, Biological Survey collection, from Mujeres Island, Yucatan, Mexico. Collected March 24, 1901, by E. W. Nelson and E. A. Goldman.

*Distribution.* Mujeres Island and occasional on adjacent shore of eastern Yucatan.

*Description.* Male with close general resemblance to *I. c. nelsoni* but smaller with slightly paler and more chrome yellow underparts; broad frontal band of black bordering bill; decidedly less white on wings. Female: Dingy cadmium yellow like the female of *I. c. igneus*.

*Dimensions of type.*—Wing 80; tail 90, culmen 18; tarsus 23.

***Icterus cucullatus cozumelæ* new subspecies.**

Cozumel Hooded Oriole.

*Type* No. 167,652, ♀ ad., U. S. National Museum, Biological Survey collection, from Cozumel Island, Yucatan, Mexico. Collected April 11, 1901, by E. W. Nelson and E. A. Goldman.

*Distribution.*—Cozumel Island, Yucatan.

*Subspecific characters.*—Males similar in color to *Icterus cucullatus igneus* but rather smaller with larger bills. Females decidedly smaller than those of *I. c. igneus* with underparts paler, duller yellow; middle of back grayer; yellow on top of head and rump more greenish or olivaceous.

*Dimensions of type.*—Wing 74; tail 75; culmen 17; tarsus 23.

*Remarks.*—Both males and females of this form may be distinguished from *I. c. duplexus* by their deeper coloration.

***Stelgidopteryx ridgwayi* sp. nov.**

Ridgway's Rough-winged Swallow.

*Type* No. 167,947, ♂ ad., U. S. National Museum, Biological Survey collection, from Chichen Itza, Yucatan, Mexico. Collected January 29, 1901, by E. W. Nelson and E. A. Goldman.

*Distribution.*—Yucatan and other parts of Mexico south of the Isthmus of Tehuantepec, and probably adjacent part of Guatemala.

*Description.*—Lores with distinct grayish white spots just back of nostrils; rest of upper parts blackish brown, darkest on wings and tail and slightly paler on rump and tertiaries, latter narrowly edged with grayish white (color of upper parts much darker than in *S. serripennis*); throat, breast and sides of body grayish brown, palest on throat, rest of underparts of body white; under tail coverts white with broad black tips to longest coverts; size larger than *S. serripennis* and tail much more deeply emarginate.

*Dimensions of type.*—Wing 117; tail 57; culmen 9; tarsus 12.

*Remarks.*—This well marked species was common in Yucatan, living in the caves in the sides of cenotes or natural wells. They were also found about the foothills at Teapa, Tabasco. Its dark back and black tips to under tail coverts render it easily separable from its nearest relative, *Stelgidopteryx serripennis*.

***Troglodytes peninsularis* new species. Mangrove House Wren.**

*Type* No. 168,115, ♂ ad., U. S. National Museum, Biological Survey collection, from Progreso, Yucatan, Mexico. Collected March 5, 1901, by E. W. Nelson and E. A. Goldman.

*Distribution.*—The arid coastal belt of northern Yucatan.

*Specific characters.*—A pallid species with general resemblance to *Troglodytes aedon aztecus* but with heavier bill and feet; shorter wings and tail, and more reddish brown suffusion, especially on underparts. Upperparts dull bistre brown, becoming paler and more reddish on rump and tail; throat, middle of breast and abdomen white, lightly suffused with pale fulvous; sides of neck and body strongly suffused with dull reddish brown, darkest on flanks; under tail coverts whitish with narrow blackish bars narrowly bordered with dull reddish brown.

*Dimensions of type.*—Wing 50; tail 38; culmen 14; tarsus 18.

*Remarks.*—We found this wren very common among the scattered growth of mangroves over a broad salt flat bordering the lagoon back of Progreso. A few were seen in the brush-grown country adjoining the flats but the latter were apparently their home. They were in full song



the first of March and were about to breed. They were commonly seen probing for food in the clay mud on the flats and all the specimens killed had their feet and bills (to the angle of the gape) coated with dried mud.

***Merula plebeia differens*** new subspecies. Forest Robin.

*Type* No. 142,532, ♂ ad., U. S. National Museum, Biological Survey collection, from Pinabete, Chiapas, Mexico. Collected February 8, 1896, by E. W. Nelson and E. A. Goldman.

*Distribution*.—Known only from type locality in southern Chiapas.

*Subspecific characters*.—Entire upperparts including head, wings and tail decidedly browner than in *M. plebeia*; lower parts more uniform and darker brown; throat uniform with breast with scarcely a trace of dark streaks; feet and bill darker than in *M. plebeia*.

*Dimensions of type*.—Wing 141; tail 105; culmen 23; tarsus 35.

*Remarks*.—Seen only in the heavy forest above 7500 feet.



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GENERAL NOTES.

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**The bat genus *Pteronotus* renamed *Dermonotus*.**

In 1815, Rafinesque, in his 'Analyse de la Nature' (p. 54), substituted *Pteronotus* in place of *Pteropus*, apparently simply because he did not like the latter name. Of course there was no justification for such a procedure and *Pteronotus* is a pure synonym of *Pteropus*. Nevertheless, the name was given and consequently its use for another genus precluded. However, Gray gave the same name in 1838 to a genus of Phyllostomoid bats, not knowing of its previous use by Rafinesque. As no other has been given to exactly the same type, a new one must be substituted and *Dermonotus* is appropriate, referring to the extension of the skin of the wings and interfemoral membrane upon the back.

Those mammalogists who rank *Pteronotus* and *Chilonycteris* as sections of one comprehensive genus for which the latter name has been used will be more reconciled to the change when they consider that a less serious one will be entailed. It has been generally overlooked that *Pteronotus* was published a year earlier than *Chilonycteris* (1838 instead of 1839) and consequently that name would have to be used instead of *Chilonycteris*, generally employed for the genus. An examination of the types of the two genera has led me to believe that the two groups should be regarded as generically distinct, if current views as to generic differentiation are to be adopted. *Theodore Gill.*

**An addition to the avifauna of the United States.**

During the summers of 1892 and 1893, when accompanying the party then engaged in surveying and re-marking the boundary line between Mexico and the United States, Mr. Frank X. Holzner and I found the

Mexican Cliff Swallow, *Petrochelidon melanogaster* (Swainson), in abundance in the states of Chihuahua and Sonora, Mexico. It also crossed into Arizona, along the San Bernardino and Santa Cruz rivers, breeding on both sides of the international boundary line. Five or six specimens including adults of both sexes and young recently from the nest, were collected in Arizona, and are now in the United States National Museum.—*Edgar A. Mearns*.

#### A new *Cypripedium*.

*Cypripedium reganum*, n. sp.—Allied to *C. pubescens* and *C. parviflorum*. Differs from both, but especially from *parviflorum*, by the oblong stigma, rounded and almost truncate at the end. Agrees with *pubescens* in the large flowers, but the lip is very bright yellow as in *parviflorum*. Leaves and stems glabrous, with only a few scattered gland-hairs. Flowers very slightly fragrant.

Upper sepals as long as the lip; lower much shorter; petals narrow, longer than the lip, usually twisted. Lip much inflated, laterally compressed, pubescent at base within, speckled with dull red within, faintly speckled on outside above towards the apex; sterile stamen triangular, spotted like the lip. Leaves lanceolate. Stems a foot to a foot-and-a-half high.

Measurements in millimeters:—Upper sepals, length 35–45; lower, length 32–40; breadth, (two united) 15–19; petals, length 45–57; greatest breadth, 7; lip, length, 33–41; breadth, 14–19; sterile stamen, length, 14, breadth, 6.

Leaves with about 6 prominent and 6 weaker veins; average of the larger leaves, length, 135, breadth, 40.

*Hab.*—Sapello Canyon, Las Vegas Range, N. M., about 8000 ft. (Canadian Zone); in full flower in June. Many specimens examined. The type will be placed in U. S. National Museum.—*T. D. A. Cockerell and P. and M. Barker*.

#### A new name for *Mus obscurus* Miller.

The name *Mus obscurus* which I recently applied to a small rat from Tioman Island, off the east coast of the Malay Peninsula (Proc. Washington Acad. Sci., II, p. 213, August 20, 1900) is preoccupied by *Mus obscurus* Waterhouse (Proc. Zool. Soc. London, V, p. 19, 1837). It may therefore be replaced by *Mus pullus*.—*Gerrit S. Miller, Jr.*

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TWO NEW SUBTERRANEAN CRUSTACEANS FROM  
THE UNITED STATES.

BY W. P. HAY.

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During a recent visit to the Mammoth Cave of Kentucky, and Nickajack Cave in Tennessee, the writer was fortunate enough to obtain from the former twelve specimens of a small eyeless shrimp, and from the latter about as many specimens of an Isopod crustacean belonging to the genus *Cæcidotea* Packard.

The shrimp on examination proves to be so distinct from all the *Palaemonidae* hitherto described as to necessitate the erection of a new genus. The Isopod, as it came from the type locality of *Cæcidotea nickajackensis* Packard was at first thought to be that species, but a careful comparison with Dr. Packard's description and figures and with specimens of *C. nickajackensis* from wells at Metcalf, Georgia, shows that it is distinct.

The new genus and the two new species may be described as follows:

***Palaemonias*** gen. nov.

Similar to *Palaemonetes* in form and in the absence of a mandibular palpus. Gills four and a rudiment on each side. Rostrum long, slender

and serrate above and below. Antero-lateral margin of carapace with two spines. First two pairs of ambulatory appendages sub-equal in size and similar in form; chelate and with large bunches of pectinate bristles on the distal extremities of the fingers. The articulation of the hand with the carpal segment is at a point on the lower surface of the hand some distance from the proximal end; and the prominent knob-like extremity fits, when the limb is fully extended, into a broad sinus formed by the margin of a plate-like expansion of the carpus.

***Palæmonias ganteri* sp. nov.**

Carapace about one third the total length, very thin and delicate. Rostrum as long as the antennal scale, its upper surface with about fourteen small teeth, lower surface with two or three teeth. Eye stalks rudimentary and without pigment. Antennules bi-flagellate. Antennæ longer than the body. Color in alcohol white; in life nearly transparent. Length about one inch and a quarter.

Named for Mr. H. C. Ganter, the manager of the cave, who through his deep interest in the scientific study of its fauna and flora was led to afford me exceptional facilities for making my investigations.

***Cæcidotea richardsonæ* sp. nov.**

Body slender but broader than in either *C. stygia* or *C. nickajackensis*. Margins of the head, body segments and telson hairy. Antennules as long as the peduncle of the antennæ, the flagellum with fifteen segments. Antennæ long and very slender, the flagellum with about sixty-five segments. Legs much longer than in the other species of this genus. Uropods of nearly uniform diameter throughout, slender, about one half as long as the body and thickly beset with short stiff hairs.

Color in life and in alcohol white.

Named for Miss Harriet Richardson, whose papers on North American Isopods are well known.

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THE PROPER GENERIC NAMES OF THE VISCACHA,  
CHINCHILLAS, AND THEIR ALLIES.

BY J. A. ALLEN.

In a recent paper entitled, 'The Name of the Viscacha',\* Mr. Oldfield Thomas leaves in doubt the proper allocation of the genus *Callomys* D'Orbigny and Geoffroy Saint-Hilaire. As the application of the generic names given to the different species of the Chinchillidæ is involved in some obscurity, a brief history of the case may serve to throw a little light on some of the intricate points.

The first distinctive generic name applied to any member of the group appears to be *Viscaccia* Schinz, given in 1825 to the Viscacha of the pampas of the La Plata. The next in order is the name *Lagostomus*, given by Brooks in 1828 to the same animal, which name thus becomes a synonym of *Viscaccia* Schinz. In 1829 Bennett used the name *Chinchilla* in a generic sense for the Chinchillas of the Chilian Andes. In 1830 Lichtenstein gave the name *Oriomys* also to the same animals. The other of the three generic groups of this family was named *Lagidium* by Meyen in March, 1833, and *Lagotis* by Bennett a few months later in the same year. Regarding the application of these names there is, apparently, no question. The

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\*Proc. Biol. Soc. Wash. XIV, p. 25, April 2, 1901.

case, however, is different with *Callomys* D'Orbigny and Geoffroy Saint-Hilaire mentioned above.

The authors of this genus included in it three species only, namely, *Callomys viscaccia*, *Callomys laniger*, and *Callomys aureus*. The first had already been assigned to the genus *Viscaccia* by Schinz, and upon the second the name *Chinchilla* had been bestowed by Brooks. This leaves the *Callomys aureus* only for consideration. *Callomys aureus* is based on furrier's skins, lacking the feet, the ears and the tail, and, of course, the skull; consequently the species may be treated as indeterminate and consequently *Callomys* is indeterminate. Waterhouse and others have considered *Callomys aureus* as referable to the genus *Lagidium*, but it would seem an unwarranted proceeding to displace *Lagidium* with the name *Callomys* on the basis of a species so imperfectly described as *C. aureus*. It hence seems proper to recognize for the three genera of the Chinchillidæ the names *Viscaccia*, *Chinchilla*, and *Lagidium*.



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BIOLOGICAL SOCIETY OF WASHINGTON

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NOTE ON THE NAMES OF A FEW SOUTH  
AMERICAN MAMMALS.

BY J. A. ALLEN.

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A recent examination of G. Fischer's 'Zoognosia' (Vol. III, 1814), shows that a number of the names currently attributed to later authors originated with Fischer; also that a few of Fischer's names for South American mammals antedate those of Wied and Schinz. Among the former may be mentioned *Felis eyra*, *Nasua rufa*, and *Nasua fusca*, usually attributed to Desmarest, 1820, but all date from Fischer 1814; also *Dasyppus villosus*, attributed to Desmarest 1819, dates from Fischer 1814. *Nasua socialis* Wied, 1826, is antedated by *Nasua sociabilis* Schinz, 1821.

*Dasyppus cilliatu*s Fischer, 1814, antedates *Dasyppus patagonicus* Desmarest 1819. This species will consequently stand as *Ziädyns cilliatu*s (G. Fischer).

A comparison of Schinz's 'Thierreich', 1821, with Wied's 'Reise nach Brasilien', 1822, and Wied's Beiträge zur Naturgeschichte von Brasilien' (II, 1826) shows that Schinz was the first to publish a number of the names attributed by him to Wied, and since thus generally accredited. Apparently not only Schinz, Kuhl, and Temminck had access to Wied's collections but in many cases adopted and published his manuscript names several years before Wied published them himself,

so that the author for the name is, in many cases, not Wied, as usually given, but Schinz, Kuhl, or Temminck. In some cases, however, the names used by these authors differ from those adopted later by Wied; for example, *Desmodus rufus* Wied is antedated by *Rhinolophus ecaudatus* Schinz, so that the name *Desmodus rufus* Wied should give place to *Desmodus ecaudatus* (Schinz). *Felis wiedi* Schinz, 1821, antedates *Felis macroura* Wied, 1826. *Canis azarae* Wied, 1826, is also antedated by *Canis brasiliensis* Schinz, 1821, although the name *Canis brasiliensis* is attributed by Schinz to "Neuwied". Schinz also employs the name *Felis brasiliensis* (ex Wied) for the Black Jaguar, previously named *Felis nigra* by Erxleben which Wied finally did not see fit to designate by a technical name. But *Felis brasiliensis* Schinz renders untenable *Felis brasiliensis* F. Cuvier, 1828, applied to another animal.

It may be further noted in this connection that in all probability *Vespertilio villosissimus* E. Geoffroy, 1807, based on the Chauve-souris septième of Azara, will have to be adopted for the Bat named *Vespertilio bonariensis* Lesson & Garnot, 1820, and now commonly known as *Lasiurus bonariensis*, but which should stand as *Lasiurus villosissimus*. That Azara's Chauve-souris septième is not referable to the *Lasiurus cinereus* group, as stated by Mr. Thomas (Ann. and Mag. Nat. Hist., (7) Vol. VIII, Nov., 1901, p. 435), is evident from its small size, which barely equals that of an average example of *L. borealis*.

As is well known, Dr. J. E. Gray gives many new names to mammals in Volume V (1827) of Griffith's 'Animal Kingdom', most of which are duly cited in synonymy, but some appear to have escaped notice. Gray divided the genus *Vampyrus* into three genera, which he named *Vampyrus*, *Istiophorus*, and *Tonatia*. *Vampyrus* is restricted to *V. spectrum*; *Istiophorus* is preoccupied by Lacépède for a genus of fishes, and has been replaced by Gray's latter name *Trachops*; *Tonatio* has for its type and only species *V. bidens* Spix, and is thus the exact equivalent of Mr. Thomas's subgenus *Vampyressa* (1900). These divisions of *Vampyrus* established by Gray in 1827 appear to have been overlooked by later systematic writers.\*

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\*Since writing the above my attention has been called to the fact that Dr. T. S. Palmer, in 1898, called attention to Gray's treatment of *Vampyrus* (cf. Proc. Biol. Soc. Wash. XII. 1898, p. 111).

Another name proposed by Gray in the same work (Griffith's An. King. V, 1827, 228), is *Sicista*, which has as its type and only species *Mus subtilus* Pallas, which is also the type of the later *Sminthus* Keys. & Bl., 1840. The species currently referred to *Sminthus* will thus stand as follows: (1) *Sicista subtilus* (Pallas); (2) *Sicista concolor* (Büchn); (3) *Sicista lathemi* (Thomas); (4) *Sicista flavus* (True). It also follows that the subfamily named Sminthinae must give place to Sicistinae.



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SEVEN NEW BIRDS FROM PARAGUAY.

BY HARRY C. OBERHOLSER.

A small collection of birds from Sapucay, Paraguay, collected by Mr. William T. Foster for the United States National Museum contains the following apparently new species, descriptions of which, through the courtesy of the authorities of the National Museum, are here published. Full details of these together with various other critical notes will appear in a paper now in course of preparation.

**Anabazenops acritus** sp. nov.

Similar to *Anabazenops olagineus* but decidedly darker, particularly below; the color throughout greenish olive instead of olive brown; the throat more yellowish; the light areas of the lower surface more greenish.

**Leptopogon amaurocephalus icastus** subsp. nov.

Similar to *Leptopogon amaurocephalus tristis*, but larger; less purely yellow below; crown rather more brownish; the wing-bands pale ochraceous; instead of clear yellow.

**Arremon callistus** sp. nov.

Similar to *Arremon polionotus* but upper parts darker; wings with hardly any indication of a greenish yellow humeral patch; edge of wing at bend, white; black jugular band wider.

**Cyanocompsa sterea** sp. nov.

Resembling *Cyanocompsa cyanea* but bill much smaller; blue of forehead less purplish; female much darker, less rufescent brown.

**Thamnophilus ochrus** sp. nov.

Resembles *Thamnophilus caeruleus*, but the female is very much paler both above and below, with the breast pale grayish ochraceous, the middle of abdomen buffy white, and all the superior wing-coverts black tipped with white.

**Basileuterus leucoblepharus calus** subsp. nov.

Similar to *Basileuterus leucoblepharus leucoblepharus*, but flanks grayish; crissum very pale yellowish; sides and breast heavily shaded with slate gray; back and rump less yellowish olive green.

**Picolaptes tenuirostris apothetus** subsp. nov.

Similar to *Picolaptes tenuirostris tenuirostris* but much smaller; the shaft streaks on back decidedly narrower.

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DIAGNOSES OF EIGHT NEW BATRACHIANS AND  
REPTILES FROM THE RIU KIU ARCHI-  
PELAGO, JAPAN.

BY LEONHARD STEJNEGER.

BATRACHIA SALIENTIA.

*Microhyla okinavensis* new species.

*Diagnosis*.—Toes not dilated at tip, distinctly webbed at base; metatarsal tubercles rather large. Otherwise like *Microhyla flavigastra*.

*Habitat*.—Okinawa Shima, Riu Kiu Archipelago.

*Type*.—Science College Museum, Tokyo, No. 25a.

*Rana narina* new species.

*Diagnosis*.—No glandular dorso-lateral fold; tips of toes dilated into very small discs much smaller than tympanum which is perfectly distinct; no free papilla on middle of tongue; toes more than half webbed; vomerine teeth in two nearly straight series between the choanæ; belly smooth; inner metatarsal tubercle narrow, very slightly prominent, less than one half the length of inner toe; no outer tubercle; tibio-tarsal joint extends considerably beyond snout; snout long, nostrils near end of snout.

*Habitat*.—Okinawa Shima, Riu Kiu Archipelago.

*Type*.—Science College Museum, Tokyo, No. 19a.

**Rana namiyei** new species.

*Diagnosis*.—No glandular dorsolateral fold; tips of toes slightly dilated at tips; no free papilla on middle of tongue; lower jaw with a pair of tooth-like bony prominences in front; toes webbed to extreme tips; interorbital width much greater than width of eyelid; vomerine teeth in two rather large, very oblique groups behind the choanæ; inner metatarsal tubercle prominent, nearly as long as diameter of eye; fourth toe nearly one-third longer than fifth.

*Habitat*.—Okinawa Shima, Riu Kiu Archipelago.

*Type*.—Science College Museum, Tokyo, No. 31a.

Named for Mr. M. Namiye of the Imperial University, Tokyo.

**Buergeria iijimæ** new species.

*Diagnosis*.—Color brownish; fingers free; first finger longer than second; upper surface nearly smooth; tibia more than one-half the total length of head and body.

*Habitat*.—Okinawa Shima, Riu Kiu Archipelago.

*Type*.—Science College Museum, Tokyo, No. 19(914).

Named in honor of Prof. Isao Ijima, Imperial University, Tokyo.

**Buergeria ishikawæ** new species.

*Diagnosis*.—Color brownish; fingers free; first finger longer than second; upper surface excessively warty, the warts grouped in round clusters of smaller ones surrounding a larger; tibia not more than one-half the total length of head and body.

*Habitat*.—Okinawa Shima, Riu Kiu Archipelago.

*Type*.—National Museum, Ueno Park, Tokyo, No. 30.

Named in honor of Prof. C. Ishikawa, of the Imperial University, Tokyo.

## REPTILIA.

## SAURIA.

**Eumeces kishinouyei** new species.

*Diagnosis*.—24 to 26 scale rows round the middle of the body; usually a post-nasal; first supralabial forming sutures with nasals and second labial only; two unpaired post-mentals; lower temporal of second row largest, wedge-shaped; soles with two series of enlarged tubercles be-



tween heel and base of third and fourth toes; normally three pairs of nuchals.

*Habitat*.—Islands of Yayeyama group, Riu Kiu Archipelago.

*Type*.—Science College Museum, Tokyo, No. 22.

Named for Dr. K. Kishinouye, Imperial Fisheries Bureau, Tokyo.

#### SERPENTES.

##### ***Calamaria pfefferi*** new species.

*Diagnosis*.—Four supralabials, first slightly shorter than second; first pair of infralabials forming a suture behind mental; no azygos shield between anterior chin-shields; frontal longer than broad, about four times as broad as supraocular; one preocular; tail pointed; subcaudals 15-26 pairs; no light or dark colored collar; no spot on upper side of tail; ventral surface light-colored with two irregular rows of very distinct dark brown spots; tail underneath with a median brown longitudinal band.

*Scale formula*.—13 scale rows: 158-160 ventrals:  $\frac{1}{3}$ - $\frac{2}{3}$  subcaudals.

*Habitat*.—Miyako Shima, Yayeyama group, Riu Kiu Archipelago.

*Type*.—Science College Museum, Tokyo, No. 14.

Named in honor of Dr. G. Pfeffer, curator in the Natural History Museum, Hamburg.

##### ***Disteira orientalis*** new species.

*Diagnosis*.—Maxillary teeth all grooved; two pairs of chin-shields in contact; 23 to 25 scales round the neck, 32 to 35 round the body: frontal shield more than twice as long as broad, longer than its distance from rostral and equalling the parietals; a single anterior temporal; rostral slightly broader than deep; ventrals 326 to 341; one or two postoculars; scales strongly keeled; ventrals, except the most anterior ones, bituberculate. Yellow with black rings wider on the back and belly, and confluent on the anterior third of the latter into a black ventral band; head black with irregular yellow marks on anterior half and behind eyes.

*Habitat*.—Riu Kiu Seas.

*Type*.—Science College Museum, Tokyo, No. 29. Collected in Okinawa Shima.

*Remarks*.—I have examined two additional specimens in the Hamburg Museum (Nos. 2574, a-b) collected by Mr. Lenz on Iriomote Shima, Yayeyama group, on March 13, 1897. Also a specimen in the Leyden Museum (No. 1483) collected by von Siebold in "Japan".



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A NEW WHITE-FOOTED MOUSE FROM CALIFORNIA.

BY WILFRED H. OSGOOD.

The mouse here described is a slightly characterized form of the '*austerus-canadensis* group' which is one of several in the genus *Peromyscus* well known to be very much in need of thorough revision. Until such revision can be made it seems best to treat this form as a subspecies of *Peromyscus oreas*\* which is apparently its nearest relative. It occupies the humid coast strip of northern California, having a range coinciding with that of a number of mammals and birds belonging to groups which reach their highest development farther north. It is thus the only member of the *austerus-canadensis* group found within the State of California.

*Peromyscus oreas rubidus* subsp. nov.

*Type* from Mendocino City, Mendocino Co., California. No. 91,650 Biological Survey Coll., ♀ yg-ad. Collected Nov. 17, 1897 by J. A. Loring. Orig. No. 4,925.

*Distribution*.—Coast region of northern California and southern Oregon, extending south at least as far as Cazadero, California, or nearly through the redwood strip.

*Characters*.—Similar to *Peromyscus oreas* but with shorter tail and smaller hind foot; general color, particularly in summer, shades of ruddy brown or chocolate instead of shades of brown tinged with yellowish. Similar to *Peromyscus austerus* but somewhat larger and lighter in color. Skull similar to that of *P. oreas*, well distinguished from that of *P. austerus*.

*Color*.—*Type* (in worn summer pelage): Upperparts brownish fawn

\* Bangs, Proc. Biol. Soc. Wash. XII, 83-84, Mar. 24, 1898.

with an evident dark median dorsal line, sides brownish fawn, being of a shade somewhat between the chocolate and fawn color of Ridgway (Pl. III, figs. 2 and 22); ears lightly edged with whitish, lanuginous tufts usually with a few white or whitish hairs; dark spot at base of whiskers nearly obsolete; underparts white; tail sharply bicolor.

*Skull*.—Not definitely distinguishable from that of *Peromyscus oreas*;† decidedly larger and heavier than in *P. austerus*; braincase fuller and wider; rostrum and infraorbital region heavier; audital bullæ larger.

*Measurements*.—Although the skull of *P. rubidus* is not appreciably smaller than that of *oreas* the hind foot is constantly smaller and the tail shorter. The following table indicates this difference.

*Peromyscus oreas.*

Number.	Sex.	Locality.	Length.	Tail.	Hind foot.
3,696†	♀	Mt. Baker Range, B. C.	200	101	24
3,694†	♂	" " " "	207	114	24
89,861	♀	Mt. Rainier, Wash.	206	112	24
89,863	♀	" " "	204	118	23
89,870	♀	" " "	210	117	23
90,077	♂	" " "	197	107	23
Average, 6 adults.			204	111	23.5

*Peromyscus oreas rubidus.*

Number.	Sex.	Locality.	Length.	Tail.	Hind foot.
91,650	♀	Mendocino, Calif.	203	99	21
91,648	♀	" "	189	99	21
91,647	♂	" "	190	95	22
98,401	♀	Briceland, Calif.	200	100	22
98,402	♂	" "	180	90	21
97,232	♀	Hoopa Valley, Calif.	200	96	22
Average, 6 adults			193	96	21.5

†In the series before me the nasals are very slightly longer in *oreas* than in *rubidus* but it does not seem safe to assume that this slight difference is constant.

‡Coll. of E. A. and O. Bangs.

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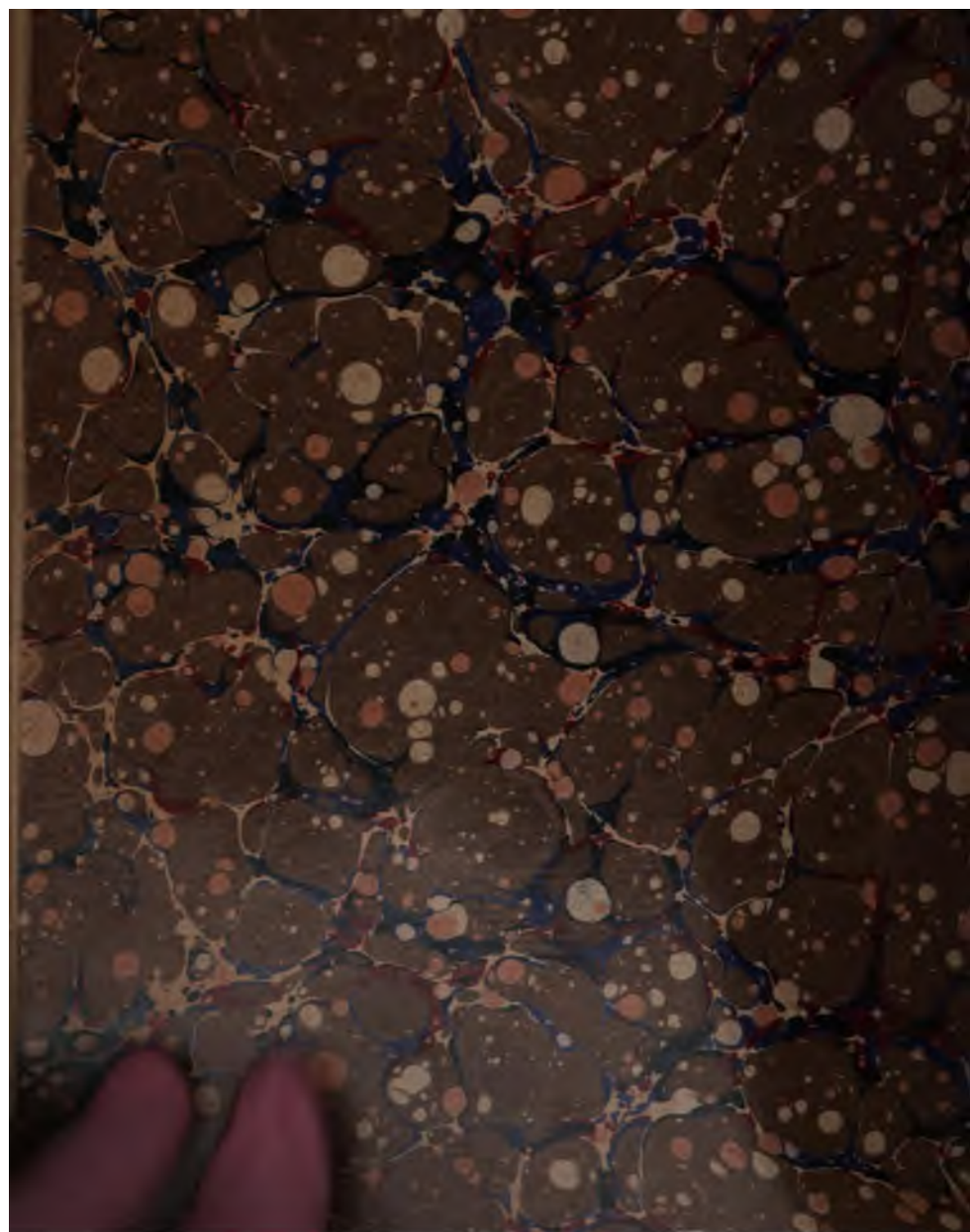


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